DEFENSE INDUSTRY BULLETIN

Volume 1 No. 11
November 1965

DOCUMENTS DEPARTMENT
UNIVERSITY OF FLORIDA LIBRARIES
GAINESVILLE, FLORIDA

D1.3/2:1/11

DEPARTMENT OF DEFENSE

Publication of

ASSISTANT SECRETARY OF DEFENSE-PUBLIC AFFAIRS

UNIV. OF FLORIDA LIBS.
DOCUMENTS
DEPARTMENT
U.S. DEPOSITORY

IN THIS ISSUE

The Changing Army ... 1
Industry and the Navy's Anti-Submarine Warfare Systems Project ... 3
A NATO Common Defense Market ... 5
Research and Development Achieved by Unique Partnership at Air Force Flight Test Center ... 14

UNIVERSITY OF FLORIDA LIBRARIES
DEC 1965

DEPARTMENTS

About People ... 7
Calendar of Events ... 8
Notes to Editors ... 10
Speakers Calendar ... 12
Meetings and Symposia ... 13
From the Speakers Rostrum ... 16
Bibliography ... 23
Defense Procurement ... 27

It's a Helicopter War

"The helicopter has been one of our most valuable pieces of equipment (in Vietnam). In addition to increased mobility and faster reaction time, it provides a close-in suppressive fire capability immediately preceding and during a helicopter troop lift into an assault area. The helicopter's battle staying capability is a matter of record. Between January 1962 and August 31 of this year, only 51 helicopters were lost to ground fire. The significance of this figure lies in the fact that when related to the actual sorties flown, this figure represents only one helicopter lost in battle for roughly every 16,614 sorties flown."

The foregoing is quoted from an address by General Harold K. Johnson, Chief of Staff, U. S. Army, before the National Security Industrial Association 22nd Annual Luncheon Meeting, Washington, D. C., Oct. 7, 1965.

For a discussion of the Army's response to the demands posed by the conflict in Vietnam, see article on page 1.

Unclassified 1966 Advanced Planning Briefings for Industry Scheduled by DOD

Deputy Secretary of Defense Cyrus R. Vance has announced that DOD will conduct a new series of unclassified regional Advanced Planning Briefings for Industry in 1966. These briefings, sponsored jointly by DOD and the National Security Industrial Association, will be held in the following metropolitan areas on the dates indicated:

Boston ---------- March 3–4
Atlanta -------- March 9–10
St Louis ------ March 16–17
San Francisco -- April 12–13
Washington, D.C -- April 27–28

Similar in purpose and scope to the briefings conducted in March and April of this year, the briefings will be designed to provide management and labor with an up-to-date DOD-wide picture of long range development needs, and to assist industry in planning for and seeking Defense contracts.

Defense contractors are again being invited to display their management improvement ideas and achievements. The exhibit of efficiencies instituted by defense industry was a highlight of the first series of briefings. Additionally, the DOD procurement counseling service will be offered in an area adjacent to the presentations during each of the two-day sessions.

Invitations to the briefings and local arrangements in the cities to be visited will be handled by NSIA Washington headquarters, its city chapters and sponsoring industries.

Facts on SEALAB II

SEALAB II, the longest deep-diving experiment ever performed, was completed Oct. 12. During the test 28 men, divided into three teams, lived at a depth of 205 feet for a total of 45 days.

The experiment utilized a new technique called saturation diving, which means that the divers' bodies became saturated with high pressure gas enabling them to live on the ocean floor for long periods of time. The pressure inside the diver's bodies matched the pressure of the water through which they traveled. The saturation diving technique also included a long and precisely controlled rate of return to the surface.

SEALAB II demonstrated new ways in which the Continental Shelves can be explored and exploited. The shelves are shallow underwater extensions of the continent which hold great potential in terms of food, minerals and ocean by-products.

In addition to proving the central thesis of the experiment, i.e., that men can live and work on the ocean bottom, SEALAB II operations:

- Demonstrated new salvage techniques.
- Demonstrated the ability of sea animals to be companions and assistants to man's underwater endeavors.
- Obtained, for the first time, numerical data on human performance while working in cold, dark water under operational conditions.
- Proved to oceanographers and biologists the value of underwater living. A large amount of data on marine life and ocean "weather" were obtained.
- Demonstrated that small groups of men can live together under hazardous conditions for long periods of time without friction if they are carefully selected on the basis of ability and job performance.

DEFENSE INDUSTRY
BULLETIN

Published by the Department of Defense

Hon. Robert S. McNamara
Secretary of Defense
Hon. Cyrus R. Vance
Deputy Secretary of Defense
Hon. Arthur Sylvester
Assistant Secretary of Defense (Public Affairs)
Col. J. B. Cross, USAF
Director for Community Relations
Col. Edwin C. Gibson, USA
Chief, Business & Labor Division

Editor........LCdr. E. W. Bradford, USN
Assoc. Editor..........Miss Cecilia Pollok
Assoc. Editor............Mr. Rick La Falce
Editorial Assistant
Norman E. Worra, JO1, USN

The *Defense Industry BULLETIN* is published monthly by the Business & Labor Division, Directorate for Community Relations, Office of the Assistant Secretary of Defense (Public Affairs). Use of funds for printing this publication was approved by the Director of the Bureau of the Budget.

The purpose of the *BULLETIN* is to serve as a means of communication between the Department of Defense (DOD) and its authorized agencies and defense contractors and other business interests. It will serve as a guide to industry concerning official policies, programs and projects, and will seek to stimulate thought by members of the defense-industry team in solving the problems that may arise in fulfilling the requirements of the DOD.

Material in the *BULLETIN* is selected to supply pertinent unclassified data of interest to the business community. Suggestions from industry representatives for topics to be covered in future issues should be forwarded to the Business & Labor Division.

The *BULLETIN* is distributed each month to the agencies of Department of Defense, Army, Navy, and Air Force, and to representatives of industry. Request for copies should be addressed to the Business & Labor Division, OASD/PA, Room 2E813, The Pentagon, Washington, D.C. 20301, telephone, OXford 5–2709.

Contents of the magazine may be reprinted freely without requesting permission. Mention of the source will be appreciated.

The Changing Army

by

Maj. Gen. Michael S. Davison, USA
Deputy Assistant Chief of Staff for Force Development
Department of the Army

Any Army which stands still cannot survive. Unless a constant stream of new ideas coupled with technological progress meshes into the Army, obsolescence sets in. It is especially vital during these days of constant turmoil and crisis that we continue to develop modern and up-to-date doctrine and systems.

This year we have introduced a new Army Concept Program. Far-sighted concepts that look 20 years into the future assure a foundation for effective materiel development. The Army of the near future is largely determined by weapons and systems under development. Nevertheless, there are future goals sought by the Army that are not constrained by current and near-term equipment. The Army Concept Program is designed as a management instrument to assure the orderly, coordinated achievement of those goals.

But how do we deal with the immediate situation at hand such as the struggle in Vietnam? We have, in that country, a team with the appropriate name ACTIV which stands for "Army Concept Team in Vietnam." This team is stationed there as an element of the Joint Research and Test Activity. ACTIV evaluates Army concepts, doctrine and materiel and recommends improvements to increase the combat effectiveness of both United States and Vietnamese forces.

ACTIV reports are not based upon dreams and assumptions from ivory towers, but upon reliable data obtained by direct observation of combat operations. These data are analyzed and evaluated and are then reported, with appropriate recommendations, to the Army and Department of Defense decision makers. In addition, ACTIV formal reports are sent to the Defense Documentation Center, Cameron Station, Va., where they are available to other Government agencies and to civilian organizations who have the proper security clearance and can establish a need-to-know.

The early ACTIV reports were instrumental in proving the operational effectiveness of helicopters in Vietnam. Some significant early findings, verified by experience, were that suppressive fires from escorts significantly reduced the number of hits on escorted helicopters and that armed escort helicopters can operate effectively in a counterinsurgency environment like that prevailing in Vietnam.

Other ACTIV findings are that the Caribou airplane proved well suited for the Army's forward area support needs. Its short takeoff and landing capability permits regular use of short, rough, unimproved airfields, the only fields available to many units in Vietnam.

ACTIV has also shown that the Mohawk aircraft can provide timely, high quality target information of significant value.

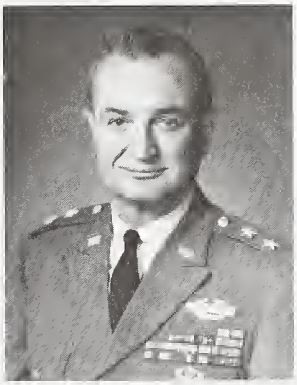
The large buildup of Army aircraft occurring now in Vietnam is, in part, a tribute to the pioneer work done by ACTIV in Vietnam over two years ago.

In the area of ground operations, ACTIV evaluation of the M-113 troop carrier established that it could be effectively employed in the difficult terrain of Vietnam.

Other facets of the Vietnamese operation, including logistics, are under continuous scrutiny by ACTIV.

We try to react rapidly to requests for materiel from Vietnam by a procedure permitting Army component commanders to place requirements for non-standard materiel direct to Army headquarters.

We then take action in coordination with the Army staff to get the materiel into the hands of the troops in the shortest possible time. In some cases, years have been chopped off the routine procurement time. Some examples of equipment sent to Vietnam in quantity under these direct action procedures are: crew protection kits for Army aircraft, body armor for combat troops, weapons of several types, cargo and fuel handling equipment and radios for Army aircraft.



Deputy Assistant Chief of Staff for Force Development Major General Michael S. Davison is responsible to the Army Chief of Staff for development of doctrine, systems and units required to maintain a flexible, trained force structure in the Army. General Davison is a former Chief of Staff of the V U. S. Corps in Germany and Commandant of Cadets at the U. S. Military Academy.

Ambush from the cover of heavy vegetation along roads, power lines and canals in Vietnam has been a favorite and effective Viet Cong tactic, which at one time took a heavy toll of casualties. The use of chemical defoliants to open up many areas has resulted in a marked decrease in these ambushes.

Chemical defoliation of jungle areas at first presented difficulties. This was a new problem, and some of the initial efforts were not too effective. However, needed equipment, such as special sprayers, was rapidly developed along with the acquisition of better knowledge of the type and amounts of chemicals needed and the best time of the year to use them. Spraying is now accomplished effectively and rapidly both from the air and on the ground.

Use of the defoliants has resulted in additional unexpected success, which so often happens with military developments. Vietnamese farmers are now harvesting the defoliated trees and using the wood for fuel. Previously, they were afraid to enter the jungle because of the Viet Cong. Also, the land can be cultivated after the wood has been cut.

Riot control agents, such as tear gas, have promising prospects for the clearing of tunnels and flushing Viet Cong from other hiding places. The Viet Cong's ruthless use of women and children as shields gives them an advantage on which they capitalize to the limit. In these cases, harmless tear gases are far preferable to bullets and grenades.

The major responsibility of the Office of the Assistant Chief of Staff for Force Development (ACSFOR) is providing General Westmoreland the Army forces he needs in Vietnam. This has been accomplished quite successfully.

On Juy 14, Defense Secretary McNamara went on a five-day fact-finding trip to Vietnam. On July 28, the President addressed the nation and announced U.S. forces would be increased in Vietnam by 125,000 men. The next day, the First Brigade of the 101st Airborne Division arrived in Vietnam. On Sept. 14 the First Cavalry Division was in the country and, in early October, the rest of the First Infantry Division arrived. One brigade of this division arrived in Vietnam in mid-July. These are major units. When we consider the entire spectrum of units ranging from divisions to small detachments, we have sent over 400 units to Vietnam.

On the surface, this is merely a matter of issuing orders to trained units and monitoring their execution. However, a substantial number of the smaller units and detachments had to be newly activated to meet requirements peculiar to operations in Vietnam. The big job, of course, was being done by Continental Army Command and the subordinate commands. Meeting demands placed on our personnel resources and logistics have challenged planners and operators at all levels. Deployable personnel have been somewhat of a probem—substantial replacements being required in a given unit prior to deployment in many cases. Nevertheless, units have deployed on or close to schedule.

While meeting low intensity warfare requirements in Southeast Asia, we must retain our capability to reinforce worldwide deployments and to meet other contingencies. To retain this flexibility the Army was authorized a 235,000-man increase.

This brings up another responsibility of ACSFOR: in coordination with other Army staff agencies, provide direction and guidance to the Continental Army Command for this force buildup. In terms of major units, this increased manpower adds to our current force structure an infantry division and three infantry brigades. This increase almost doubles the untrained input into the active Army during the fiscal year.

No potential enemy should mistakenly conclude that our increased support to the Republic of Vietnam weakens our ability to come to the aid of other free peoples.

Since World War II our global commitments have required that our soldiers be trained to fight anywhere from Polar regions to jungle and deserts.

For individual soldiers and combat units destined for Vietnam we have increased our use of the counterinsurgency and jungle operations training facilities in Hawaii and elsewhere. We are currently examining the need for further increases in the use of these training facilities. As an example of the increase in this type of preparatory training for duty in Vietnam, 250 selected officer and NCO unit instructors from the First Cavalry Division (Airmobile) and the First Infantry Division were given special courses of instruction in counterinsurgency and jungle operations immediately following notification of alert for deployment. As a minimum, all soldiers deploying to Vietnam undergo a mandatory training program ranging in scope from lectures on the nature of communist-inspired insurgency and the organization and method of operation of the Viet Cong to field training in the techniques of ambush and counter-ambush.

We have reorganized our officer training for advisors being assigned to the Military Assistance Command in Vietnam. Beginning in October, officer specialists will attend a special six-week course oriented toward Vietnam in either civil affairs, psychological operations, or intelligence. Those officers scheduled as advisors to Republic of Vietnam divisions and corps and at sector and subsector level will receive special six-week military assistance training advisor courses. About 50 per cent of the advisors will be given additional Vietnamese language training for 12 weeks at the Defense Language Institute. This program will provide optimum training in the United States with a reduction in pipeline time.

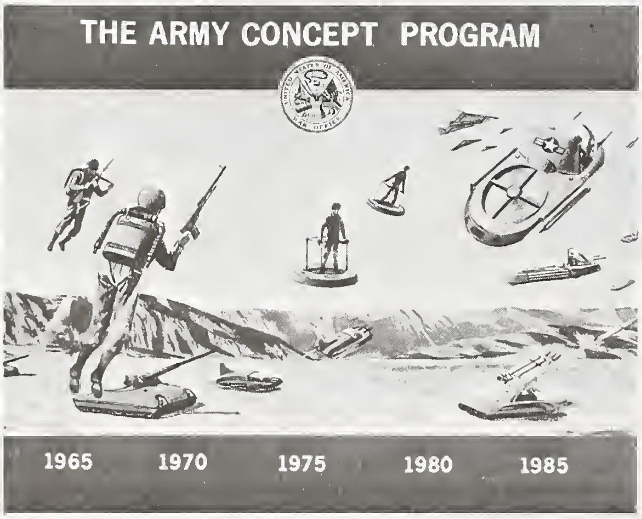
Finally, a few words on the many ideas the Army receives from the public. About 350 of these arrive each month, mostly covering aspects of the Vietnam situation. Many ideas are already in practice or have already been considered. Some are humorous while others are really new and of interest. All ideas are carefully considered and some are sent to Vietnam for on-the-spot review.

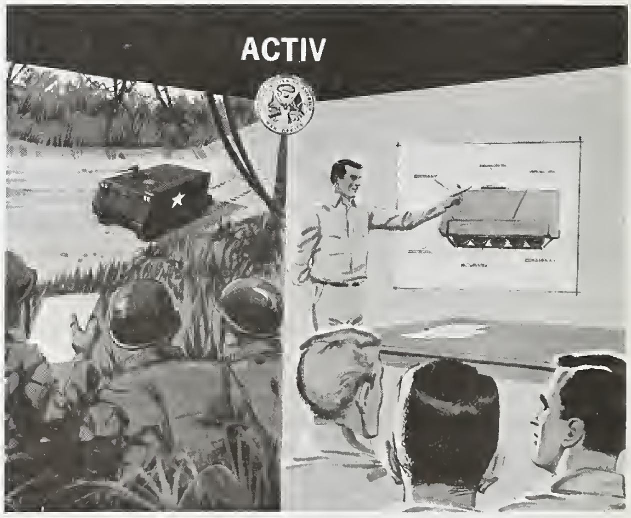
Every suggestor receives a reply from either a top official of the Government or a general officer. Use of sentry dogs has caught the fancy of many. The Army is indeed using dogs in Vietnam, especially on foot patrols. However, we wish we had a dog that could spot Viet Cong among other Vietnamese.

Two young students from Rochester University came to Washington recently at their own expense with a carefully prepared idea. They presented a technical analysis containing a radar application for detecting armed Viet Cong. Their concept warrants and is getting a prompt, hard look at the Army's limited war laboratory, Aberdeen, Md.

While many individual, interesting and novel suggestions are submitted to the Army, it is to the defense industry that the Army looks for its hardware. It has been gratifying to see the response that industry has made to the Army's requirements for new equipment to be planned, constructed, tested and produced in a limited period of time to meet the current demands of Vietnam.

This is a brief over-view of things being done to develop and maintain a modern, balanced, ready Army, particularly in support of the conflict in Vietnam. Every effort is being made to meet the operational demands of today's world while, at the same time, we try to chart the course for the Army of the future. Our success in the first task is subject to finite measurement; for the second we must await the judgment of time.





Industry and the Navy's Anti-Submarine Warfare Systems Project

by
Captain V. P. Healy, USN
Director, Plans and Programs Group
Anti-Submarine Warfare Systems Project
Office of Chief of Navy Material

Anti-Submarine Warfare—or "ASW" in Navy talk—was a crucial problem during World War II. The problem of countering the submarine is as yet only partially solved and remains one of the Navy's most serious challenges today.

There are two primary differences between the ASW problems of 1945 and 1965. First, our possible antagonists have more submarines and, second, the individual submarine is incomparably more formidable. Not counting a moderate number of Russian-built submarines in the hands of communist block nations, the free world *could* be faced with a drive for control of the sea by more than 400 submarines of the Soviet fleet. Most of the modern Soviet submarines are post-World War II snorkel boats of the "W" Class. Others, such as the "Z" Class, are relatively new, highly efficient undersea weapons. In addition, an unknown and relatively small—but growing—number of Soviet submarines are nuclear powered.

Just as the capabilities of submarines have increased in recent years, so has the Navy's ability to develop and deploy improved anti-submarine weapons systems. The central element in the Navy's drive for technical superiority over the undersea threat is the Navy's Anti-Submarine Weapons Systems (ASWS) Project, headed by Rear Admiral C. A. Karaberis and chartered in July 1964. The goal of the ASWS project office is to provide for the ASWS technical effort:

- Immediate executive authority to accomplish the Navy's ASW goals in the most effective manner.
- A fast-acting decision mechanism.
- A quick recognition and correction of problems.
- A single focal point to which industry can come for ASW.
- A concentration of resources and talent.
- A singleness of purpose.

To do this, the ASWS project office provides centralized technical direction and management control to all ASW systems, whether they are mounted on aircraft, ships, submarines, or fixed installations. This centralized direction and control extends from the developmental stage of the technical ASW system, through the production phase and into the logistical support of the system after it is installed and operating.

The direction and control which the ASWS project manager are charged with exercising are of two types: direct management and project direction.

The ASWS project office exercises *direct management* of most on-going ASW work. This effort was formerly carried out within the Bureau of Ships (BUSHIPS) and the Bureau of Naval Weapons (BUWEPS) but has now been physically relocated to the ASWS project office. The aim of this arrangement is to forge strong bonds where otherwise there could be interfaces or planes of weakness at project or office boundaries.

The other type of control exercised by the ASWS project manager is *project direction.* This takes the form of technical direction and financial control over other efforts related to ASW which remain within BUSHIPS and BUWEPS.

In capsule form, then, the mission of the Navy's ASWS project is to control technical effort related to ASW. How is this done?

To explain how the ASWS project office carries out its duties, it is necessary to explain how the office is organized. The office is now staffed by 365 people, up from a 10-man nucleus when the project was chartered 16 months ago. These carefully selected specialists form three groups: the Plans and Programs Group, the Technical Group and the Systems Analysis Staff.

The Plans and Programs Group, as its name implies, looks at the future, assigns resources, prepares and justifies the budget and evaluates progress. As part of its look at the future, it prepares "time-quantity" plans against which development, production, test, installation and all other aspects of ASW technical progress will be measured.

Capt. Vincent P. Healey, USN, is Director of Plans and Programs for the Manager, Anti-Submarine Warfare Systems Project. Prior to this assignment, he commanded Destroyer Squadron THREE operating in the South China Sea in support of operations in Vietnam.

The Technical Group, largest of the three with about 250 personnel (75 per cent of which are engineers), exercises the *direct management* and *project direction* previously described.

The Systems Analysis Staff has the responsibility for analyzing ASW systems for effectiveness—both for their technical effectiveness and their cost effectiveness. It also conducts operations research studies.

Reviews to date have revealed a number of action-demanding problems—problems which form recurring patterns as system after system reveals similar strengths and weaknesses. Eventually, under Admiral Karaberis' direction, all major Navy ASW systems will be subject to complete technical scrutiny.

The ASWS project will concentrate management attention on:

- Improving the *reliability* of ASW systems, both existing systems and new ones.
- Improving the *maintainability* of these systems.
- Emphasizing quality control.
- Minimizing configuration changes.
- Integrating equipment and vehicle design more carefully.
- Increasing the liaison between engineering and production organizations.

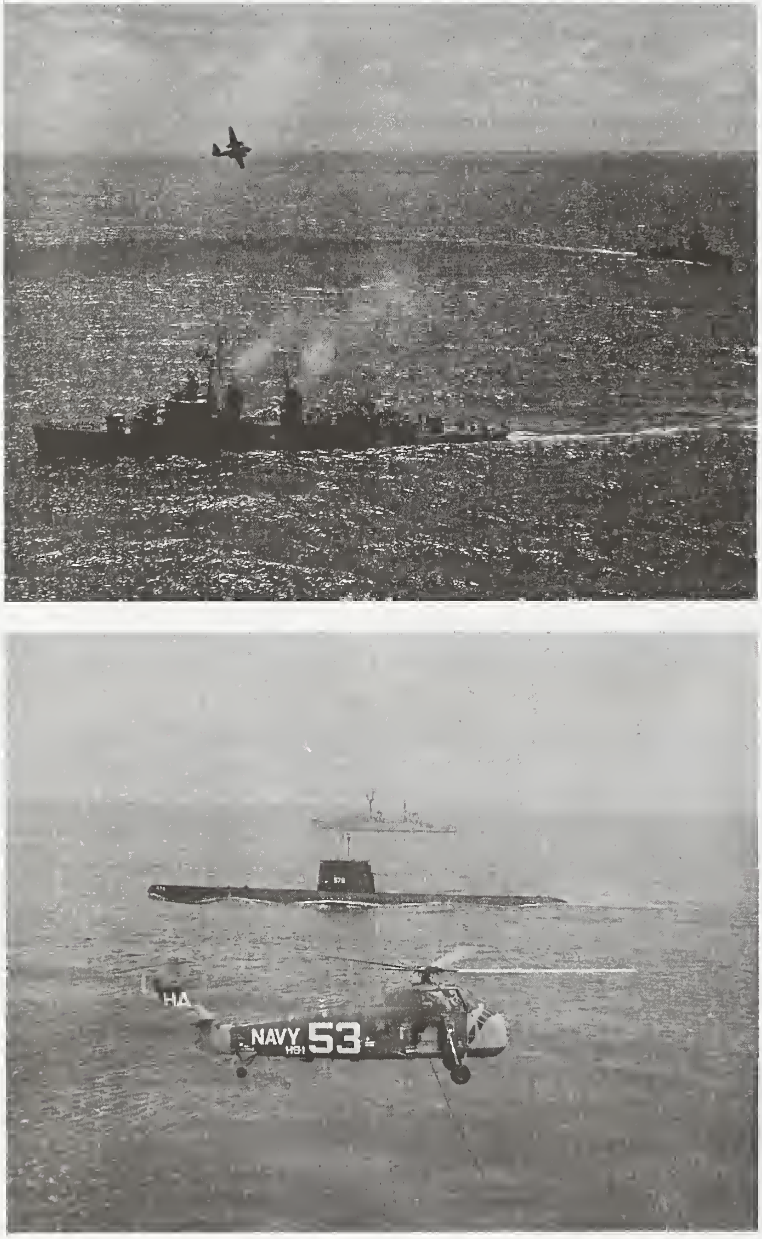
Responsibility for good management of ASW projects rests squarely on the shoulders of Admiral Karaberis and upon those to whom subsidiary responsibility has been assigned. Formerly, before the ASWS project office was established, this responsibility was fragmented. Now, it is specifically assigned to the project manager and specifically accepted by project personnel. The spirit and outlook of the ASWS project office is marked by full acceptance of the challenge to provide better management to the Navy's drive for improved technical efficiency in ASW.

A similar responsibility also devolves upon industry. If the ASWS project's efforts to analyze systems have revealed anything, they have revealed this: there is a gap between the ability of ASW systems to perform in the fleet and the level of effectiveness proved to be possible during the developmental process. The actual performance of delivered systems has at times been less than designers had predicted and at times we, the Navy, due to operational schedules, have had to accept equipment which did not fully meet contractual requirements. This is particularly true in regard to reliability and maintainability. As an example, in one of our sonar systems we were able to increase substantially the mean time between failures (MTBF) in all modes of operation as the result of a design review for reliability. Also, after a few months of operational experience, we found that the reliability could be further increased.

The Navy acknowledges its responsibility for providing the necessary management guidance and technical guidance to industry. Can industry accept the challenge of delivering systems which perform "as advertised?" Can industry close the gap and make the promises of research and development come true in reliability, maintainability and in general, all around systems effectiveness?

The Navy's ASWS project means, to industry, that a strong hand is on the technical helm. Responsibility for excellence of technical ASW systems is centered in the ASWS project office in the Munitions Building, 19th and Constitution Avenue, N. W., Washington, D. C.

The ASWS project office expects that American industry in its turn will willingly assume responsibility for producing technically superior ASW systems in the same manner that the ASWS project manager has assumed the responsibility for the overall effectiveness of technical ASW systems.



Anti-submarine warfare weapons systems in action.

Reduction in Classified Inventories Brings Savings

Visits by Defense Department officials to contractor companies engaged in classified Defense work have revealed startling data on savings that can be achieved by making periodic reviews to reduce classified inventories.

Significant savings were realized and security enhanced by these companies by assuring that only those documents actually needed were retained and all excess copies eliminated by appropriate means. Instead of acquiring new cabinets and other storage facilities when existing resources were exhausted, a little time, effort and money were expended to reduce what was on hand. Unless classified inventories are already at rock-bottom levels, a net savings is almost sure to result from such a review.

Reductions of inventories are accomplished mainly by destruction of unneeded documents, by return to the owner when destruction is not authorized and by declassification. Downgrading can produce savings by reducing the quantity of documents for which accounting records are maintained and periodic inventories conducted.

Continuing and periodic reviews to reduce classified inventories are requirements stated in Executive Order 10501, DOD regulations and the Industrial Security Manual.

Army-Navy Museum Agreement Signed

The Association of the U.S. Army has announced the signing of a joint agreement with the Navy League of the United States and the National Park Service for the construction and administration of a national Army-Navy Museum.

More than half a million dollars in donations have been obtained through fund drives by the Army Association and Navy League for construction of the museum, which will be located in Philadelphia's Independence Square National Historical Park.

The museum building will be an accurate reproduction of the three-story colonial brick Pemberton House which stood on the museum's selected site during the Revolutionary War. By terms of the agreement, the National Park Service will be responsible for superintending construction of the building.

The Army-Navy Museum will have nearly 4,000 square feet of space in which to memorialize the colorful history of the two Services. Panoramic and dioramic displays and other items will recall the more important historic events of the period covering the birth of the Army and the Navy.

A NATO Common Defense Market

by

Henry J. Kuss, Jr.

Deputy Assistant Secretary of Defense

(International Logistics Negotiations)

Three major subjects have hit the newspapers of this country in the last six months which relate to the subject of this article—"A Common Defense Market."

First, Secretary of Defense McNamara on several occasions announced the extensive orders, commitments and options which had been taken by the Defense Department and U. S. industry in the last four years for the supply of military products of our allies. The latest of these, in August, noted that since the end of FY 1961:

- The United States has received orders, commitments and options for over $9 billion of military equipment.
- These orders have brought over 1,200,000 man years of employment, spread through all 50 states and the District of Columbia.
- The cash receipts alone from these orders would amount to almost $5 billion during this period, offsetting approximately 40 per cent of the dollar costs of the U. S. Armed Forces abroad.

This shows we have already a type of allied common market for defense products. If we had not been able to compete, and if our Allies had not been willing to eliminate some of the obstacles of international trade, we would not have had anything like this size of program.

The second major point to remember in the last year is that on May 30 Secretary McNamara was reported in the press of the world to have proposed the creation of a "common market" for defense products within the North Atlantic Treaty Organization. *The New York Times* quoted Secretary McNamara as saying that he would be discussing with various ministers the joint development and joint production of arms and a movement towards what, in effect, would be a NATO common market for defense production. In general, most of the press responded favorably to this idea. For example, the *Washington Post* stated that, whether or not the remark was on the spur of the moment, it had great appeal, and noted that for too long now the NATO nations had been stating the desirability of standardizing military weapons within the alliance and pooling production facilities—and yet only getting around to this in very limited fields.

There were, of course, some negative comments as well. Some people indicated that it was all well and good to make such grandiose statements but that they were sure that the industrial lobbies of America would never allow a two-way street approach on any terms. Thus, the groundwork was laid for a series of discussions and new initiatives on common defense production in NATO—in effect a NATO common defense market.

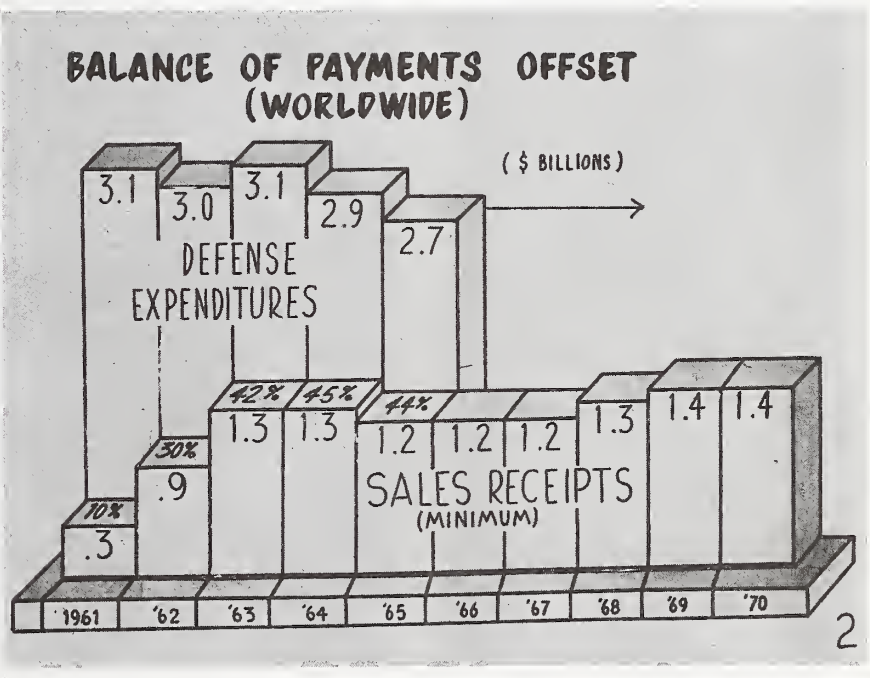
A few months later the press carried stories concerning the third major subject related to such common market activity. The Department of Defense initiated discussions with the United Kingdom leading to the competition by the British shipbuilding industry on four classes of ships in direct connection with the large UK orders or options for U. S. aircraft. It is true that this ship procurement was only a small proportion of the UK aircraft orders but it is starting the two-way street process in the highly competitive manner characteristic of a common market style operation.

Thus, in the space of the last six months, we have all become increasingly aware, in industry and Government, of a tremendous flow of goods from the U. S. to our allies as a result of their own competitive buying practices. At the same time we have recognized the need to consider a two-way street for such activities where allied industries were sufficiently competitive.

I believe we are dealing with a program which should be clearly recognized by industry as motivated by our self-interest, and a program which motivates the self-interest of our allies throughout NATO, for both cost reduction as well as industrial reasons. It is my intention to describe my personal views on this living program—to talk about its basic premise, to describe the characteristics of a common market approach as I see it and to describe the kind of activities I foresee over the long range future in implementing this idea. These are my personal views at the moment since in the final analysis the actual program will be developed by give and take consideration within the agencies of our Government, between our Government and industry and between ourselves and those allies who purchase large quantities of material from us and who have the industries capable of contributing on a competitive basis to the defense posture of NATO.

Basic Premise.

Turning first to our basic premise, let me first say that I have been seeking the advice and counsel of 26 members of industry on the Export Committee of the Defense Industry Advisory Council with respect to the basic principles of operation and implementation of any new initiatives for a defense common market. Through these representatives we



have also established a liaison with the International Committees of the National Security Industrial Association, Electronic Industries Association and Aerospace Industries Association. Thus, you can see what I meant when I spoke of give and take between Government and industry.

In these considerations, Mr. Mansfield Sprague, a Vice President of the American Machine and Foundry Company and a former Assistant Secretary of Defense for International Security Affairs, attempted to describe, in one piece of paper, the broad premises of a common market program. His paper provides me with a quite understandable and statesmanlike basis for viewing U. S. export actions in the world today. It bears repeating here and I quote:

"The years since World War II have thrust on the United States the lonely responsibility for the major defense effort in the free world and the unsought task of exercising primary leadership in the struggle for both prosperity and survival.

"The economics of free world defense have required above all flexibility and a willingness to alter course with changing circumstances. In 18 years we have run the gamut from outright grant aid to offshore procurement, to military assistance loans, to infrastructure, to joint production, to outright sale and export of United States produced military hardware. The rapid growth of such sales to our allies in recent years is illustrated by the $9 billion of purchase orders and options received from foreign sources for domestic produced military equipment. It is expected that this level of exports, approximately $2 billion a year, can be maintained over the next 10 years. However, this vital export program has triggered a serious question. How long will this trend be allowed by foreign governments to continue without some compensating inducement to them to sell less expensive but essential equipment to us?

"A meaningful answer is provided by the common market defense procurement concept initiated by Secretary McNamara, the implementation of which is now being hammered out jointly by Government and industry.

"The basic premise underlying this challenging project is grounded in these essential facts:

"1. NATO and the loosely organized Atlantic Community are indispensable to world peace, to prosperity within the community and to finding a cooperative solution to the enormous struggle of the free developing nations for economic progress and freedom.

"2. Common defense absolutely requires a sharing of the economic burdens which it imposes.

"3. The vast military production potential of this country developed at our own expense for our own and the free world's survival makes it possible for our allies to purchase United States produced hardware and systems for substantially less than if they were separately or even jointly to develop home-grown comparable products.

"4. For reasons of national prestige and economic policy our allies will insist on developing and producing some equipment which can be done competitively and with acceptable quality.

"5. The defense export program of the United States at current levels is essential both to the United States and to our allies:

"a. To provide them with the most up-to-date effective hardware at the lowest cost.

"b. To increase commonality of weaponry.

"c. To mitigate our balance of payments problem which is generally recognized by our allies as having been caused and continued by the commitments we have made to them for worldwide defense through troop concentrations overseas, grant military and defense support assistance on the periphery of the communist bloc countries and the provision of vast economic aid to countries whose stability is threatened by poverty and ignorance.

"6. To maximize this vital export program and to make it politically and economically more attractive to overseas allies, it is appropriate that we consider launching and supporting a program designed:

"a. To purchase on a competitive basis defense selective items produced in allied countries for the United States defense establishment.

"b. To assist allied countries to maintain a defense production capability sufficient to induce defense budgets at a level constituting their fair share in each case of the free world defense burden, and which capability is primarily in items which are compatible with the free world competitive situation for defense products.

"c. To foster increasing military, political and economic planning and integration in these areas with the United States and Canada.

"d. To achieve the greatest, most cost-effective free world defense production for the common defense.

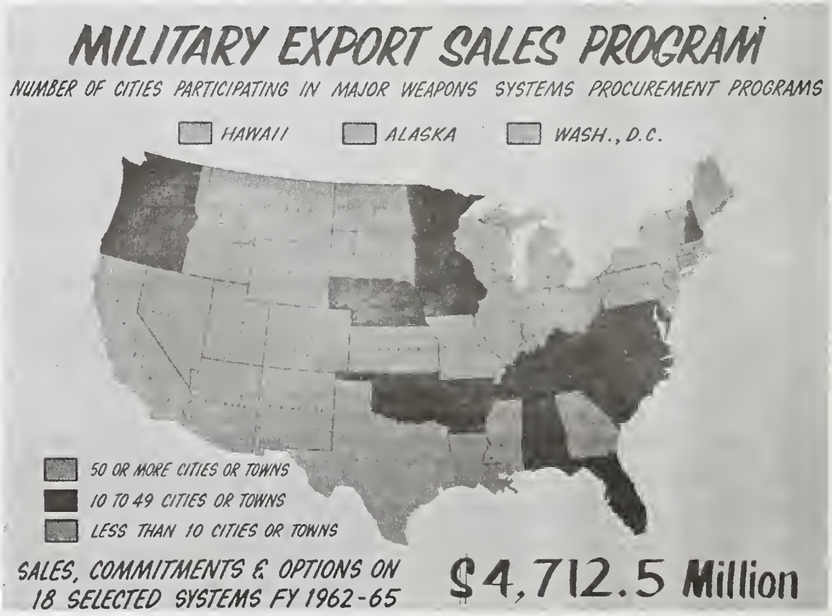
"No policy to be considered by the United States will have domestic support or foreign credence unless it is rooted in our own self-interest. But self-interest does not require only that it is solely profitable to this country and is a one-way street. In fact, our very successful defense export programs will be increasingly counter productive without the acceptance of the same concept of free flow of trade which dominates international common markets. The common defense market idea is simply a recognition of this fact and proposes an enlightened method for its implementation."

Characteristics of a Common Defense Market.

So much for our premise. Let us turn our attention to the characteristics of a common defense market and the kind of steps which might be taken towards achieving the benefits of such a market.

A common market in its purest form probably does not exist anywhere in the world and may never exist in its purest form. A common market in its theoretical form would eliminate all barriers to the free flow of trade, technology and capital. Thus,

(*Continued on page 24*)


MILITARY EXPORT SALES PROGRAM
NUMBER OF CITIES PARTICIPATING IN MAJOR WEAPONS SYSTEMS PROCUREMENT PROGRAMS
HAWAII
ALASKA
WASH., D.C.
50 OR MORE CITIES OR TOWNS
10 TO 49 CITIES OR TOWNS
LESS THAN 10 CITIES OR TOWNS
SALES, COMMITMENTS & OPTIONS ON 18 SELECTED SYSTEMS FY 1962-65
$4,712.5 Million

ABOUT PEOPLE

DEPARTMENT OF DEFENSE

Dr. **John S. Foster, Jr.**, is the new Dir. of Defense Research & Engineering. He succeeds Dr. **Harold Brown** who is the new Secretary of the Air Force.

Maj. Gen. Frank T. McCoy, USAFR, has been appointed to a three-year term as a member of the Reserve Forces Policy Board succeeding **Brig. Gen. Joseph T. Benedict, USAFR**, whose term has expired.

RAdm. Elton W. Sutherling, USN, has been amed Dep. Commander for Operations of the Military Traffic Management and Terminal Service.

Capt. Walter W. Tolson, USN, has been appointed Dir., Detriot Defense Contract Administration Services Region, a field activity of the Defense Supply Agency. He succeeds **Col. Warren E. Besse, USA**, who is retiring.

Capt. Joseph S. Burkle, USN, has relieved **Capt. Charles G. Bratenahl, USN**, as Dep. Dir. of the Armed Forces Radiobiology Research Institute, Bethesda, Md. Capt. Bratenahl has been reassigned as Executive Officer, National Naval Medical School, Bethesda.

Col. Fred E. Hayes, Jr.. USMC, has replaced **Brig. Gen. Eugene L. Strickland, USAF**, as Dir., Near East and South Asia Region, Office of Assistant Sectary of Defense (International Security Affairs).

Edgar B. Hamilton, Jr., has been named Chief of the Public Information Div., Military Traffic Management & Terminal Service. Mr. Hamilton was formerly an information officer for Military Air Transport Service.

Col. Samuel F. Miller, USAF, has been assigned Asst. Dir. for Contract Administration Services, Office of Asst. Secretary of Defense (Installations & Logistics).

DEPARTMENT OF THE ARMY

Dr. **Robert A. Brooks**, has been designated as Asst. Secretary of the Army (Installations & Logistics). Secretary Brooks was formerly with a Boston, Mass., management consultant firm.

Lt. Gen. Thomas W. Dunn has been named to succeed retiring **Lt. Gen. Robert W. Colglazier, Jr.**, as Commanding General, Fourth U.S. Army. **Lt. Gen. William F. Train**, now serving as Commanding General, Second Army, will replace Gen. Dunn as Commanding General, First Army. The Second Army will be consolidated with the First Army under General Train's command.

The Army's Nike-X Project Office at Redstone Arsenal, Ala., has announced the assignment of Dr. **Oswald H. Lange** as Chief Scientist and **Charles E. Richardson** as Chief Engineer. Dr. Lange was formerly with the NASA Marshall Space Flight Center. Mr. Richardson was the former Chief, Nike X Project's Test and Range Operations Div.

John M. Bialo has been selected to serve as the Army Test & Evaluation Command's top technical advisor on electronics, Aberdeen Proving Ground, Md.

Six Army Materiel Command general officers have been promoted to the rank of major general. They are: **Maj. Gen. William C. Gribble, Jr.**, Dir., Research & Development; **Maj. Gen. Henry A Miley, Jr.**, Dir., Procurement & Production; **Maj. Gen. Charles W. Eifler**, Dep. Commanding General, Land Combat Systems, Army Missile Command, Huntsville, Ala., **Maj. Gen. Woodrow W. Vaughan**, Commanding General, Army Natick Laboratories, Mass.; **Maj. Gen.. William B. Latta**, Commanding General, Army Electronics Command, Fort Monmouth, N.J.; and **Maj. Gen. Kenneth H. Bayer**, Dep. Dir., Research & Development.

Col. Rodger E. Lawless replaced **Col. James H. Schofield, Jr.**, as Project Manager of the Army Materiel Command's Selected Tactical Radios Activity

Col. Morton M. Jones, Jr., has been named Project Manager for General Purpose Vehicles, AMC.

Col. Mitchel Goldenthal has been designated Acting Project Manager for the U.S. Sattellite (SATCOM) Agency. He is located at Fort Monmouth, N.J.

Col. Erling J. Foss has been named Project Manager for the European Tropospheric-Scatter Communications Systems-Army (ET-A). The project office is located at Fort Monmouth, N. J.

DEPARTMENT OF THE NAVY

The **Surgeon General of the Navy Robert B. Brown** has been promoted to the three-star rank of vice admiral.

Capt. Robert J. Wooding, CEC, formerly Dir., Southeast Div., Bureau of Yards & Docks (Budocks), Charleston, S. C., has been promoted to the rank of rear admiral and assigned as Officer in Charge of Construction, Budocks Contracts, Republic of Vietnam, Saigon. **Capt. John G. Dillon, CEC**, has replaced him as Dir., Southeast Div., Budocks.

Capt. R. A. Hubbard has been assigned to the Office of Chief of Naval Operations as Assistant for Programs and Financial Management.

DEPARTMENT OF THE AIR FORCE

Dr. **Robert G. Loewy**, of the University of Rochester, N.Y., is the new Chief Scientist of the Air Force succeeding Dr. **Winston R. Markey** who has returned to M.I.T.

Jackson R. Stalder has been named Chief Scientist of the AF Flight Dynamics Laboratory, Wright-Patterson AFB, Ohio. He is the first to hold the position since August 1963, when the laboratory was organized under the Research Technology Div., AFSC.

Brig. Gen. Henry B. Kucheman, Jr., recently promoted to his present rank, has been reassigned as Dep., Limited War, Aeronautical Systems Div., AFSC, Wright-Patterson AFB, Ohio.

Brig. Gen. William H. Brandon has been reassigned as Commander, Air Base Wing 1605, MATS, and Commander U.S. Forces, Azores. **Brig. Gen. Roy W. Nelson, Jr.**, replaced Gen. Brandon as Vice Commander, Western Air Force, MATS, Travis AFB, Calif. **Col. Russel K. Pierce, Jr.**, has been assigned to replace Gen. Nelson as Commander, Air Weather Service, MATS, Scott AFB, Ill., from duty as Commander Third Weather Wing, MATS, Offutt, AFB, Neb.

Col. Paul G. Galentine, Jr., replaces **Col. Gustav E. Lundquist** as Dep. Engineering & Technology, Electronics Systems Div., AFSC, L. G. Hanscom Field, Mass. Col. Lundquist will become Dep. Commander, Rome (N.Y.) Air Development Center.

Col. Frederick C. Krug has been named Chief, Structures Div., AF Flight Dynamics Lab, Wright-Patterson AFB, Ohio.

The new AF Rocket Propulsion Laboratory director at Edwards AFB, Calif., is **Col. Elwood M. Douthett**. He replaces **Col. Joseph M. Silk**, who has retired.

Col. F. H. Foerster, Jr., has succeeded **Col. George E. Harrington** as Commander, Rome Air Materiel Area, Griffiss AFB, N.Y. Col. Harrington has been reassigned to Hq., Air Force Logistics Command, Wright-Patterson AFB, Ohio.

Col. Guy M. Townsend has been named C–5A System Program Dir. with station at AFSC's Aeronautical Systems Div., Wright-Patterson AFB, Ohio. He relieves **Col. Warner F. Rankin, Jr.**, who will remain with the System Program Office as Asst. Dir.

Air Force Logistics Command (AFLC) has designated **Col. Harold Walker** C–5A System Support Manager assigned at the San Antonio Air Materiel Area, Kelly AFB, Tex. **Lt. Col. George Grubic** will represent the C–5A System Support Manager at AFLC headquarters, Wright-Patterson AFB, Ohio.

CALENDAR OF EVENTS

Dec. 1–3: National Assn. of Mfg. Meeting, New York City.

Dec. 4: Aviation Demonstration, Fort Sill, Okla.

Dec. 5–9: American Institute of Chemical Engineers Meeting, Philadelphia, Pa.

Dec. 6–8: Chemical Specialties Mfg. Assn. Meeting, Washington, D.C.

Dec. 8–9: National Security Industrial Assn. and Air Force Systems Command Conference on "The Applications of Microelectronics Technology" at Sheraton Park Hotel, Washington, D. C.

Dec. 13–15: American Institute of Aeronautics & Astronautics Specialist Meeting, New York City.

Dec. 17: 62nd Anniversary of Powered Flight.

Dec. 26–31: American Assn. for Advancement of Science Meeting, Berkeley, Calif.

Jan. 10–14: Society of Automotive Engineers Convention, Detroit, Mich.

Jan. 11–12: Man's Extension Into the Sea, Tentative Industrial Information Program, Washington, D.C.

Jan. 13: 18th Pacific Coast Regional National Security Industrial Assn. Dinner, Los Angeles, Calif.

Jan. 24–27: American Meteorological Society Meeting, Denver, Colo.

Jan. 24–27: American Society of Heating, Refrigerating & Air Conditioning Engineers Meeting, Houston, Tex.

Jan. 30–Feb. 4: American Society of Civil & Structural Engineers Meeting, Miami Beach, Fla.

Jan. 31–Feb. 4: American Society of Civil Engineers Meeting, Miami Beach, Fla.

Feb. 28–March 2: 8th Joint National Security Industrial Assn. Industry-Military-Government Packaging & Materials Handling Symposium, Sheraton Park Hotel, Washington, D.C.

Engineering Research, Inc., A Small Business That Gets Contracts

Small industrial concerns which avoid seeking Government contracts because of tight competition or other reasons can be encouraged by the success of a small company in Indianapolis, Ind.

The record of this business concern demonstrates how efficiently operated small business manufacturing firms have the potential to become sources capable of delivering quality products at prices lower than previously paid in open competition and still make a satisfactory profit.

In 1953, Engineering Research, Inc., of Indianapolis, Ind., was incorporated. The company had never submitted a bid to the U.S. Navy Aviation Supply Office (ASO) until 1964 when it was introduced into the ASO Procurement Plan by the Small Business Specialist. Thereafter, frequent bids were submitted and E. R. Inc., was awarded nine ASO contracts within a period of nine months. This company continued to bid successfully during the 18-month period since filing a Bidders Mailing List Application. By June 30, 1965, the company had received 22 contracts totaling $252,896 in value. These contracts were awarded for various items, some of which had already been procured under open competition and others which had been procured from Sole Source. Items included special bolts, lock assemblies, military standard adapters and fittings, housing assemblies, nozzles, pin assemblies, swivel assemblies and cylinder assemblies. Break-out of the Sole Source items by ASO and the successful competition by E. R. Inc., saved the U.S. Navy a total of $65,142.56 in comparison with previous Sole Source prices and prices bid by previously successful competitive bidders.

Eight hundred and seventy-four Invitations For Bids were issued to prospective bidders for the 22 contracts. Two hundred and thirty three bids were submitted. E. R. Inc., was the lowest bidder for each contract and established a peace-time record at ASO for the number of competitive contracts awarded, within both the short period of nine months and the 18-month period, to a single small business manufacturer.

E. R. Inc., received subcontracts from such prime contractors as General Motors Allison Division and Magnovox Corp. Due to the increased volume of business being received and the extended recognition of this company by other Government procurement agencies and, in anticipation of continued success in bidding competitively at these agencies, this company constructed a new and larger plant and installed the latest type of machines and equipment.

Indiana Industrial Procurement Conference Scheduled for December

The Indiana Industrial Procurement Conference is scheduled to be held on December 15, 1965, at the Claypool Hotel in Indianapolis, Ind.

The conference will be sponsored by the Indiana Manufacturers' Association in cooperation with the Governor of the State and the Indiana Congressional delegation.

Federal Government agencies that will participate include the Defense Supply Agency, Army, Navy, Air Force, Atomic Energy Commission, National Aeronautics and Space Administration, General Supply Agency, Small Business Administration and the Department of Commerce.

Information on the conference may be obtained from A. C. Conde, Executive Vice President of the Indiana Manufacturers' Association, 832 Indiana Building, 120 East Market Street, Indianapolis, Ind., or from the DOD Coordinator, C. F. Cinquegrana, Defense Supply Agency, Cameron Station, Alexandria, Va.

Dallas-Fort Worth Small Business Council Formed

Representatives of nine major Texas prime contractors in the Dallas-Fort Worth area have set up a Council for Small Business and Labor Surplus Area Opportunities.

The purpose of the council is to improve communications through an exchange of ideas on the requirements of small business laws and regulations, study problem areas and instill a deeper spirit behind the Small Business Act by aiding and encouraging small business concerns whenever and wherever possible.

The initial meeting, held in October, was attended by representatives of Collins Radio, Ling-Temco-Vought, Bell Helicopter, EMTEX, Intercontinental Manufacturing Co., General Dynamics, Menasco, Geotechnical and Texas Instruments. During the first session details of the organization were worked out and plans formulated to meet quarterly.

AF Cites 17 Defense Contractors for ZD Efforts

Seventeen defense contractors have been selected to receive the first semiannual Achievement Awards approved in the Air Force's Zero Defects (ZD) Program.

The selections are a result of an Air Force awards program designed to recognize significant contractor Zero Defects accomplishments. Its goal is to improve quality by developing pride of workmanship, personal responsibility and integrity in each individual and group that contributes to the production of Air Force equipment.

Participation by contractors in the Air Force program is voluntary. The Industrial Zero Defects Program, adopted by the Defense Department, is an outgrowth of the employee motivation concept that has gained increasing favor in American industry during the 1960's.

Under the Air Force award program, prime contractors are eligible for three types of recognition:

- The Participation Award — Designed to recognize employees who participate in a contractor-sponsored ZD type program considered to be within parameters established by the Air Force. Minimum contractor requirements include provisions to measure accomplishments and participation by 10 per cent of his plant personnel for 90 days or longer.
- The Achievement Award — To honor employees who have demonstrated significant achievement and/or improvements against contractor established program goals on a semiannual basis.
- The Annual Craftsmanship Award — Demands a combination of sustained performance and outstanding achievements in cost reduction/avoidance, production reliability, safety, reduction in workmanship errors/scrap/rework and other areas which can be attributed directly to the Zero Defects Program. To qualify for the Craftsmanship Award employees of a contractor must have received two achievements awards during a 12-month period.

The winners of the awards were approved by the Air Force Systems Command's seven-man Industrial Zero Defects Council which includes representatives from the Electronics, Aeronautical and Ballistic Systems Divisions.

The firms selected for Achievement Awards are:

General Electric Co., West Lynn, Mass.

Hercules Powder Co., Kenvil, N. J.

General Electric Co., Evendale, Ohio

Kaiser Aerospace & Electric Corp., San Leandro, Calif.

Martin - Marietta Corp., Middle River, Md.

Lockheed Missile & Space Co., Sunnyvale, Calif.

Martin - Marietta Corp., Denver, Colo.

Hercules Powder Co., Magna, Utah

RCA Communications Systems Div., Camden, N. J.

Hughes Aircraft Co., Culver City, Calif.

RCA Missile & Surface Radar Div., Moorestown, N. J.

Douglas Aircraft Co., Missiles & Space Systems Div., Santa Monica, Calif.

Aerojet-General Corp., Sacramento, Calif.

Borg-Warner Corp., Pesco Products Div., Bedford, Ohio

Elano Corp., Zenia, Ohio

North American Aviation, Inc., Autonetics Div., Fullerton, Calif.

RCA Astro-Electronics Div., Princeton, N. J.

Maj. Gen. Ben I. Funk, Commander of the Air Force Systems Command's Space Systems Division in Los Angeles, Calif., presents Los Angeles Dodgers pitching ace, Sandy Koufax, a Zero Defects certificate for his perfect game against Chicago on Sept. 9, 1965.

In presenting the award, General Funk told the Dodger star that "The Air Force tries for a 'perfect game' every time we launch a space vehicle."

Phase-Out Continues at Mobile AMA

Phase II plans of the phase-out of logistics operations at Mobile Air Materiel Area (AMA), Brookley Air Force Base, Ala., have been announced by the Air Force Logistics Command. This action is a further implementation of the Secretary of Defense's directive of Nov. 19, 1964, closing Mobile AMA.

The plans for Mobile included in Phase II cover the specific logistics responsibilities and supporting personnel changes to take place from January 1966 through June 1967. Transfers will be made as follows:

To Sacramento AMA, McClellan AFB, Calif.:

- Management and supply of approximately 11,000 materiel management coded items peculiar to: F–84, F–86, F–100, F–104, F–105, F–111, T–33, T–39, 416L (AC&W), 474L (BMEWS), 496L Spacetrack, Atlas boosters and rocket engines.
- Maintenance of F–105 aircraft including the Military Support Unit.

To San Antonio AMA, Kelly AFB, Tex.:

- Management and supply of approximately 12,500 materiel management coded items peculiar to: B–58, F–102, F–106, F–5, T–38, C–131, aircraft engines (jet and reciprocating), electrical and electronic test equipment, and aerospace ground equipment.
- Maintenance of engine accessories (FSC 2995), miscellaneous engine components (FSC 2835), air-conditioning and refrigeration equipment (FSG 41), pipe and tube (FSC 4730), aircraft maintenance equipment (FSC 4920), aircraft alarm systems (FSC 6340), valves (FSC 4810/20) and area support for aircraft and support equipment.

To Odgen AMA, Hill AFB, Utah:

- Management and supply of approximately 7,000 materiel management coded items peculiar to: LGM–25 Titan, LGM–30 Minuteman, Aerojet engines, F–4, F–101, B–26 aircraft, CIM–10 Bomarc, photographic equipment, training devices and landing gear systems.
- Maintenance and supply through reprogramming of resources in support of F4C aircraft.

To Oklahoma City AMA, Tinker AFB, Okla.:

- Management and supply of approximately 12,000 materiel management coded items peculiar to: B–52, C–97, C/KC–135 aircraft, ADM–20

(Continued on page 20)

NOTES FOR EDITORS

Briefed below are some events and projects within the Department of Defense which may be of interest to writers and editors. If further information on any of these topics is desired, please write to Chief, Magazine and Book Branch, Office of Assistant Secretary of Defense (Public Affairs), Washington, D. C. 20301.

MAP OPERATING THROUGHOUT THE WORLD

The Department of Defense Military Assistance Program (MAP) is supporting and encouraging civic action projects in more than 25 countries throughout the world. Civic action projects are those in which the military forces of a nation undertake activities which contribute to the economic and social development and strengthen the ties between the military and civilian communities.

Since inception of the program in 1961, activities have included providing construction material and equipment for troops building 147 kilometers of highway in Brazil; building 21 health centers and dispensaries in remote areas of Colombia; repairing and constructing roads in Guatemala and Paraguay; building hundreds of classrooms and aiding in the construction of kitchens, sewer systems and hospitals in Korea; distributing and holding language classes in addition to the primary duties of airfield, dam and road construction in Thailand; and drilling wells and increasing agricultural production in Vietnam.

ARMY EXPANDING TRAINING ESTABLISHMENT

An expansion of the Army training system began last month to provide for an input of 408,000 active Army trainees during Fiscal Year 1966, an increase of 213,000 over Fiscal Year 1965. The expansion will provide the necessary soldiers for the planned increase of 235,000 in the active Army as well as replacement of normal attrition.

The program includes the establishment of new reception and training centers at Fort Benning, Ga., and Fort Bliss, Tex., and increased capacities at present Army training centers and Army service schools. The expansion will include training of over three times as many officer candidates and broadening of the programs leading to a commission.

ARMY VERSION OF SIDEWINDER FIRED SUCCESSFULLY

Chaparral, an Army air defense weapon system currently under development, has undergone successfully guided firings at the Naval Ordnance Test Center, China Lake, Calif.

The Chaparral is designed to protect forward area Army forces against low altitude air attack. The system utilizes a modified Army self-propelled vehicle as a mount for launching the Navy-developed Sidewinder 1-C missile, using an infrared guidance system and slightly modified for the surface-to-air application. By maximum use of existing missiles and "off-the-shelf" support equipment, the Army is minimizing costs and development time.

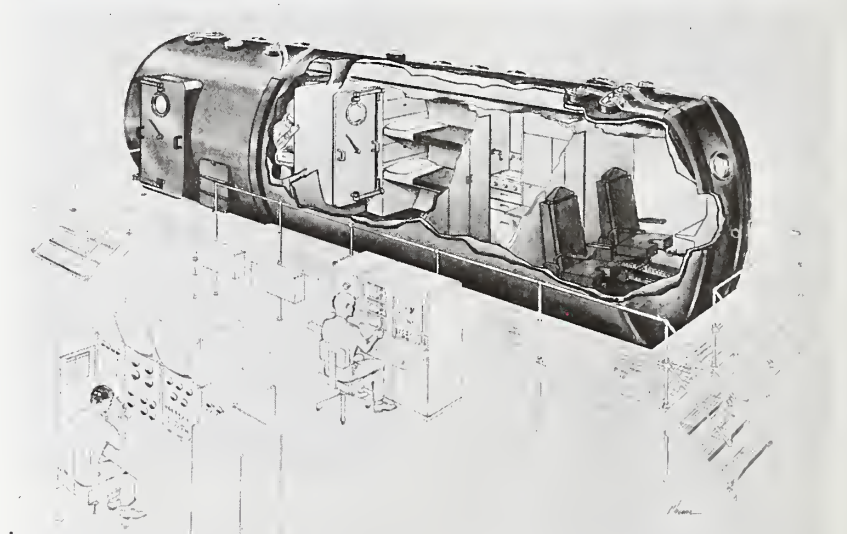
OXYGEN-HELIUM ATMOSPHERE BEING TESTED

Four U. S. Air Force flying officers began a 68-day test of an oxygen-helium combination as a possible space vehicle atmosphere on Oct. 4 when they entered a space cabin simulator at the USAF School Aerospace Medicine, Brooks AFB, Tex. The experiment, the longest such test to date, is being conducted in cooperation with the National Aeronautics and Space Administration and information gained will be used in connection with future manned space programs.

For the first eight days the test crew was at ground level altitude breathing a normal ground level atmosphere of oxygen and nitrogen. On October 13 they went to a simulated altitude of 27,000 feet for the duration of the test.

The simulator in which the test crew is working is a cylindrical, double-walled, low pressure altitude chamber 30 feet long and nine feet in diameter. The cabin is divided into two sections, the main test cell and the air lock. The space between the double walls is maintained at a lower pressure than the main test cell to insure that any leakage from the test environment is outward. Conditions within the simulator are monitored at an outside master control console.

The test is the first of four groups of experiments scheduled to run through August 1966.



An artist's conception of the manned space cabin simulator which four Air Force aircrew officers entered on Oct. 4 for a 68-day atmospheric test of 70 per cent oxygen and 30 per cent helium at the U. S. Air Force School of Aerospace Medicine, Brooks AFB, Tex. Information gained from the test will be used in connection with future manned space flight. (See last item, Notes for Editors.)

Reduction in Subscription Rate Military Specs and Standards

The Navy Department has announced that, effective January 1, 1966, new and renewal subscriptions for Military Specifications and Standards, which are listed in the Department of Defense Index of Specifications and Standards (DODISS) will be available to subscribers at the reduced rate of $4.50 per Federal Supply Class for each subscription, in lieu of the present rate of $6.00 per subscription. Refunds will not be made on subscriptions received prior to January 1.

Subscriptions provide for the automatic distribution to the subscriber of all new or revised Military Specifications and Standards in each class for which a subscription has been placed. They will continue to be accepted on a Federal Supply Classification basis and may cover a single class or as many individual classes as the subscriber chooses.

Requests may be forwarded to the Director, Navy Publications and Printing Service Office, Building 4, Section D, 700 Robbins Avenue, Philadelphia, Pa., and must be accompanied by a certified check or postal money order made payable to the Treasurer of the United States, in an amount sufficient to cover each subscription computed at $4.50 for each class desired. The subscriber should identify the individual classes covered in each subscription by the class number and title listed in the DOD Cataloging Handbook H2-1, "Federal Supply Groups and Classes."

Navy Establishes Pollution Control Office

The Navy has responded to President Johnson's request that all land under Government control be cleared of pollutant-causing factors by establishing a new office to study pollution problems and develop projects to control air and water pollution on the Navy's five million acres of land.

In charge of the new unit, known as the Bureau of Yards and Docks Pollution Control Office, is Commander James D. Day, Jr., who directs the Facilities Projects Division at the Bureau.

Commander Day said the Bureau has already developed a $14 million program for 1967 to construct facilities which will correct some of the known pollution violations.

In addition, air and waste water discharges at all naval shore establishments will be regularly checked for pollution.

New Battle Dress for AF Planes

For the first time since World War II, tactical aircraft of the U.S. Air Force are being painted in multi-colored camouflage patterns designed to reduce enemy visual detection.

The camouflage patterns are being applied to operational strike and support aircraft of the Tactical Air Force including combat planes now operating in Vietnam.

Among aircraft receiving the new battle dress are the McDonnell F–4C Phantom II, the North American F–100 Super Sabre, the Lockheed F–104 Starfighter, the Republic F–105 Thunderchief and the Lockheed C–130 Hercules.

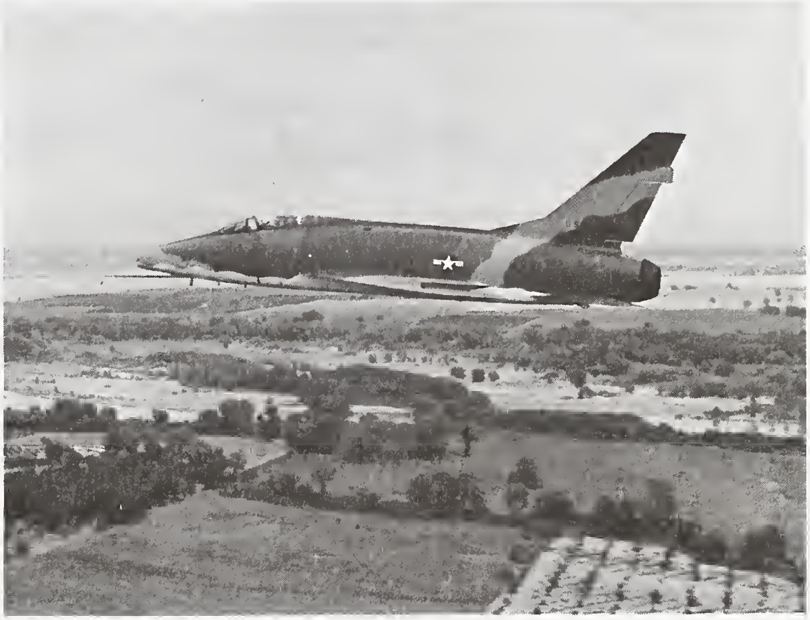
The Air Force-wide program is under the supervision of the Air Force Logistics Command (AFLC). Mobile Air Materiel Area is monitoring the project including development of patterns.

To date, the camouflage paint program has been limited to tactical and theater support aircraft. However, studies are under way to determine application to other Air Force aircraft.

Most of the painting takes place as aircraft return to their logistics homes—AFLC air materiel areas—throughout the United States for routine periodic overhaul.

Camouflage painting, arranged in patterns of brown, two shades of green and light gray, gives aircraft at modest altitudes the facility to blend into landscapes below them. This reduces the possibility of their being spotted by enemy interceptors at higher altitudes. A light gray underside helps planes at high altitudes blend into the sky, making ground detection difficult.

The use of camouflaged paint to break up the form or outline of aircraft was widely practiced in World War I and II.



A USAF F–100 fighter bomber wears a coat of new camouflage paint. The new look, designed to reduce enemy visual detection, is being applied to operational strike and support aircraft of the tactical air forces.

DEFENSE PRIME CONTRACT AWARDS TO SMALL BUSINESS

(Amounts in Thousands)

	July-Aug. 1965	July-Aug. 1964
Procurement from All Firms	4,867.5	4,008.4
Procurement from Small Business Firms	972.8	805.5
Per Cent Small Business	20.0	19.7

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

NOVEMBER 1965

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

DECEMBER 1965

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

JANUARY 1966

SPEAKERS CALENDAR

OFFICE OF THE SECRETARY OF DEFENSE

Dr. Charles M. **Herzfeld**, Dir., Advanced Research Projects Agency, at American Astronautical Society Meeting, Miami, Fla., Nov. 26.

ARMY

Lt. Gen. William F. Cassidy, Chief of Engineers, at Commonwealth Club Meeting, San Francisco, Calif., Nov. 26.

Gen. Frank S. Besson, Jr., Commanding General, U. S. Army Materiel Command, at Twin Cities Association of the U. S. Army Meeting, Minneapolis, Minn., Dec. 8.

NAVY

RAdm. O. D. Waters, Jr., Oceanographer of the Navy, at Bureau of Commercial Fisheries and University of Miami, Coral Gables, Fla., Nov. 20.

RAdm. Eugene P. Wilkinson, Dir., Submarine Warfare Div., Office, Chief of Naval Operations, at 23rd U. S. Navy Symposium on Underwater Acoustics, Washington, D. C., Nov. 30.

VAdm. I. J Galantin, Chief of Naval Material, at Anniversary of Naval Material Support Establishment, Washington, D. C., Dec. 2; at Ship Maintenance Conference, Naval Electronics Laboratory, San Diego, Calif., Dec. 15.

VAdm. C. B. Martell, Dir, Anti-Submarine Programs, Office, Chief of Naval Operations, at Joint Meeting of Chamber of Commerce and Reserve Officers Assn., South Bend, Ind., Dec. 2.

RAdm. Roy S. Benson, Asst. Dep. Chief of Naval Operations/Dir. of Naval Administration, at Canton Traffic Club Meeting, Canton, Ohio, Dec. 7.

AIR FORCE

Lt. Gen. T. P. Gerrity, Dep. Chief of Staff, Systems & Logistics, at Martin Co., Orlando, Fla., Dec. 1.

Maj. Gen. I. L. Branch, Commander, Air Force Flight Test Center, at Rotary Club Meeting, Inglewood, Calif., Dec. 3.

Gen. J. P. McConnell, Chief of Staff, at Economic Club, Detroit, Mich., Dec. 6; at National Security Industrial Assn. Meeting, Los Angeles, Calif., Jan. 13.

Maj. Gen. B. I. Funk, Commander, Space Systems Div., Air Force Systems Command, at Kappa Sigma Meeting, Dallas, Tex., Dec. 6.

Gen. B. A. Schriever, Commander, Air Force Systems Command, at National Security Industrial Assn. Meeting, Washington, D. C., Dec. 8.

Maj. Gen. M. C. Demler, Commander, Research & Technology Div., Air Force Systems Command, at Technology Symposium, Miami Beach, Fla., Dec. 14–16.

DSA Conducting Study to Improve Contractor Inventory Utilization

The Defense Supply Agency, assisted by the three Military Departments, is studying ways and means to improve the utilization of contractor inventory by the Services and the utilization by contractors of military releasable assets. This study, which covers materiel in all commodity areas other than industrial plant equipment, is being conducted by the Contractor Inventory Utilization Group (CIUG), a DOD chartered, joint service group.

A test is in progress to determine the feasibility of using existing centralized electronic data processing capabilities for mechanically screening and identifying both assets and requirements. The immediate objectives toward increasing property utilization are (1) improved item identifications and (2) a more rapid interchange of data by and between the Military Services and Defense contractors.

Initially the test was limited to the participation of five contractors selected by the Military Departments: North American Aviation, Inc., Columbus Ohio; Lockheed Missile and Space Company, Sunnyvale, Calif.; Martin Company, Baltimore, Md.; Hughes Aircraft Company, Palo Alto, Calif.; and Western Electric Company, Winston-Salem, N. C. In order to broaden and diversify the input of contractor inventory, the CIUG expanded contractor participation to include all those under the cognizance of the Inspector of Naval Material, Los Angeles, Calif.; the Air Force Contract Management District, Los Angeles; and elements of three Army commands, the Missile, Aviation and Electronics Commands.

One electronic data processing technique being employed for item identification of contractor inventory is provisioning screening. This is a process for screening manufacturers' part numbers (P/N's) and/or Federal Stock Numbers (FSN's) against a central catalog file to either obtain or validate an existing FSN. From January through June 1965 more than 100 per cent increase in identifying contractor inventory items resulted from the use of this technique.

Another technique in current use is the centralized screening of assets against requirements—utilizing the FSN's developed from provisioning screening. The data input to the central file containing assets and requirements is maintained on a DOD-wide basis. In addition to indicating exact matches, it also provides the capability for matching other than the preferred item, thus enabling the potential user to consider interchangeable items when the preferred item is not available.

Although some specific benefits to both contractors and the Military Departments have been identified with mechanized screening, the test results to date are not conclusive enough to determine that the mechanical screening of contractor inventory items is more beneficial than the method of manual screening. However, it is contemplated that these benefits will increase as a result of the expanded contractor participation and the greater volume and diversification of contractor inventory assets and requirements.

MEETINGS AND SYMPOSIA

DECEMBER 1965

Fourteenth Annual **Wire and Cable** Symposium, Dec. 1–3, at the Shelburne Hotel, Atlantic City, N.J. Sponsor: Army Electronics Command. Contact: Milton Tenzer, Symposium Chairman, Electronics Parts and Materials Div., Army Electronics Laboratory, Fort Monmouth, N.J., telephone (Area Code 201) 535-1834.

International Symposium on **Differential Equations and Theory of Systems**, Dec. 27–30, at the University of Puerto Rico. Sponsors: Air Force Office of Scientific Research, Brown University and the University of Puerto Rico. Contact: Maj. B. R. Agins (SRMA), Air Force Office of Scientific Research, Tempo D, 4th St. and Independence Ave., S.W., Washington, D.C., telephone (Area Code 202) OXford 6-1302.

JANUARY 1966

Unguided Rocket Ballistics, Jan. 11–13, at Texas Western College, El Paso, Tex. Sponsor: Army Electronics Research and Development Agency. Contact: Vertis C. Cochran, Army Electronics Research and Development Agency, White Sands Missile Range, N.M.

Research Effectiveness as Related to Vehicles, Jan. 28–29, at Detroit, Mich. Sponsor: U.S. Army. Contact: Paul D. Denn, Chief, Research Div., Army Mobility Command, Warren, Mich., telephone (Area Code 313) 756-1000.

International Symposium on **Information Theory**, Jan. 31–Feb. 2, at the University of California at Los Angeles, Calif. Co-sponsors: Air Force Office of Scientific Research and Information Theory Group of the Institute of Electrical and Electronics Engineers. Contact: Prof. J. Carlyle, UCLA, Los Angeles, Calif., telephone (Area Code 213) 478-9711, ext. 7181.

FEBRUARY 1966

Eighth Joint Industry-Military-Government **Packaging and Materials Handling** Symposium, Sheraton Park Hotel, Washington, D.C., Feb. 28–March 2. Sponsors: National Security Industrial Assn., Office of Secretary of Defense, Military Services, Department of Commerce, NASA, GSA and AEC. Contact: W. J. Monaghan, NSIA, Suite 800, 1030 15th St., N.W., Washington, D.C.

MARCH 1966

Conference on **Functional Analysis**, March 28–April 1, at the University of California, Irvine, Calif. Co-sponsors: Air Force Office of Scientific Research and the University of California. Contact: R. G. Pohrer (SRMM), Air Force Office of Scientific Research, Tempo D, 4th St. and Independence Ave., S.W., Washington, D.C., telephone (Area Code 202) OXford 6-5248.

Second International Symposium on **Aerobiology**, March 29–30, at Chicago, Ill. Sponsors: U.S. Army and Illinois Institute of Technology Research Institute. Contact: Elwood K. Wolfe, Director of Technical Services, Fort Detrick, Frederick, Md., telephone (Area Code 301) 663-4111, ext. 2214.

Bionics Symposium 1966, dates undetermined, at Sheraton Hotel, Dayton, Ohio. Sponsors: Aerospace Medical Research Laboratory, Aerospace Medical Div. and Avionics Laboratory, Research and Technology Div., all of which are elements of the Air Force Systems Command. Contact: Dr. H. L. Oeistreicher (MRBAM), Aerospace Medical Research Laboratory, Wright-Patterson AFB, Ohio, telephone (Area Code 513) 253-7111, ext 3-6108.

APRIL 1966

Second Symposium on **Marine Bio-Acoustics**, April 6–8, at American Museum of Natural History, Central Park West at 79th St., New York City and Naval Training Device Center, Port Washington, N.Y. Sponsor: Naval Training Device Center. Contact: F. E. Wolf, Jr., Research Program Manager, Naval Training Device Center, Port Washington, N.Y., telephone (Area Code 516), PO 7-9100, ext. 550.

Symposium on **Generalized Networks**, 14th in a series of international symposia organized by the Polytechnic Institute of Brooklyn, Microwave Research Institute, April 12–14, at New York City. Sponsors: Air Force Office of Scientific Research, Office of Naval Research and the Army Research Office, Society for Industrial and Applied Mathematics and the Institute for Electrical and Electronics Engineers. Contact: Lt. Col. E. P. Gaines, Jr., (SREE), Air Force Office of Scientific Research, Tempo D, 4th St. and Independence Ave., S.W., Washington, D.C., telephone (Area Code 202) OXford 6-3671.

Twentieth Annual **Frequency Control** Symposium, April 19–21, at the Shelburne Hotel, Atlantic City, N.J. Sponsor: Army Electronics Laboratories. Contact: M. F. Timm, Solid State & Frequency Control Div., Army Electronics Laboratories, Fort Monmouth, N.J., telephone (Area Code 201) 535-1728.

SPRING 1966

Second International Symposium on **Airborne Infection**, dates undetermined, at Baltimore, Md. Sponsors: Department of the Army and The Johns Hopkins School of Medicine. Contact: Elwood K. Wolfe, Director of Technical Services, Fort Detrick, Frederick, Md., telephone (Area Code 301) 663–4111, ext. 2214. (Rescheduled from October 20–21, 1965.)

Air Force, AEC to Sponsor Radioisotope Symposium in Ohio

A symposium on "Radioisotope Applications in Aerospace," co-sponsored by the Air Force Systems Command and the Atomic Energy Commission, will be held at the Sheraton-Dayton Hotel, Dayton, Ohio, Feb. 22–24.

The symposium will be directed by AFSC's Flight Dynamics Laboratory at Wright-Patterson AFB, Ohio, where the classified sessions will be held.

Colonel George T. Buck, Director of the Flight Dynamics Laboratory and E. E. Fowler, Director of AEC's Division of Isotope Development, are co-chairmen of the symposium.

The symposium is being held to exchange information, promote the use of radioisotopes and acquaint military and industrial managers with their potential.

More than 500 specialists in the use of radioisotopes are expected to attend the three-day meeting.

Research & Development Achieved by Unique Partnership at AF Flight Test Center

by

Maj. Gen. Irving L. Branch
Commander, Air Force Flight Test Center

Take 301,000 isolated acres on the western edge of southern California's 13,500-square mile Mojave Desert.

Sprinkle with several hundred million dollars worth of necessary buildings and complex equipment. Garnish with billions of dollars worth of unusual aircraft.

Spice with about 10,000 men and women—nearly all highly skilled and engrossed in their endeavors—about half of whose male members wear Air Force, Army or Navy uniform.

Mix judiciously and what have you got? A unique national defense partnership formally known as the Air Force Flight Test Center (AFFTC) at Edwards Air Force Base.

This proving ground for tomorrow's military aerospace craft daily demonstrates the results of and need for effective teamwork.

AFFTC is among 11 far-flung yet kindred centers and divisions doing specialized experimental work under the Air Force Systems Command (AFSC), headquartered at Andrews Air Force Base near Washington, D. C. Their united effort is essential in carrying out AFSC's mission—research and development of the nation's aerospace weapons systems (aircraft, missile, electronic and space)—from drawing board to operational readiness.

AFFTC teamwork with its AFSC brothers and Air Force cousins recently won a Pentagon salute—the Air Force Outstanding Unit Award to the center's 500-member military and civilian tri-command (Systems, Strategic Air and Air Defense) SR–71/YF–12A Test Force. The award was for "exceptional professional competence, initiative and devotion to duty in developing and testing" the Air Force's most advanced reconnaissance and interceptor aircraft from last January 1 to May 2. Both still are undergoing development testing. Also cited was the team effort in proving the 2,000 m.p.h. YF–12A interceptor the world's fastest with four new speed and altitude record flights May 1.

Illustrative of AFFTC-Air Force-Federal-civilian-industry partnership was the completion—a month ahead of time—of 11 months of the Air Force's most intensive functional and reliability testing of an airplane ever. The test involved Lockheed Georgia Company's C–141 Starlifter global jet transport, an increasing number of which are becoming operational for the Military Air Transport Service.

The 160-ton fanjet freighter—one of three at Edwards and five undergoing tests elsewhere at the time—completed its 2,500th and final hour of test flight last May 14. Averaging seven-and-a-half hours in the air, seven days a week, the craft pile up nearly twice the combined flying time of the other seven air freighters and six times as much as any one of them. The C–141 test program was the first in which Air Force, Federal Aviation Agency and contractor personnel worked together to qualify an aircraft both as a military and commercial cargo carrier.

AFFTC's readiness to work in double and triple harness with Federal agencies and private industry extends to its fellow Services—Army and Navy. Close cooperation with the Navy has been what might be called "doin' what comes naturally" in a 14-year association with the Naval Air Facility at El Centro, Calif. That's how long AFFTC's 6511th Test Group (Parachute) has been established there as a Navy partner in what evolved as the Defense Department Joint Parachute Test Facility.

The 6511th, which includes civilian personnel, tests and evaluates newly developed and experimental parachutes for troop jumps, supply drops, pilot escape systems and missile and capsule recovery programs. Every parachute designed for human use is put through at least 200 test dummy drops and 500 jump tests by parachutists.

It was at El Centro that AFFTC staked a notable cooperative claim to fame in air dropping what is believed a world record of 70,195 pounds of simulated cargo from a C–141. Seven large pallets—platforms nine feet wide and eight feet long, loaded with iron and steel bars—each weighing some 10,000 pounds, were shoved out the tail section as the craft flew 170 mph at an altitude of 5,000 feet. All seven landed undamaged within a half-mile area, wafted to earth by three 100-foot diameter parachutes on each pallet.

The record drop climaxed a continuing series of heavy cargo drop tests at El Centro involving Lockheed pilots and engineers, Army and Air Force loadmasters, Air Force parachutes and riggers, data acquisition equipment, instrumented parachute ranges and Navy photographic support. Meanwhile, a similar joint venture covering the whole gamut of C–141 cargo equipment and troop drops has been going on since mid-May at Fort Bragg, Fayetteville, N. C. Working together there are AFFTC and Lockheed test pilots and engineers, MATS maintenance crews and Army logistics experts and paratroops.

But let's get back to Edwards and more evidence in inter-service partnership. Illustrative is last July's start of some 18 months of extensive testing of the biggest and newest of a new kind of military transport. Centerpiece of this concerted concern is the tilt-wing XC–142 short take-off and landing (V/STOL) craft designed for Air Force, Army and Navy use. AFFTC's XC–142 tri-service test force of 200 includes test pilots, engineering and technical experts from the Marine Corps as well as from the three Services. The unique four-engine, propeller-driven craft is intended for rapid movement of troops and supplies into unprepared areas under all weather conditions. It is among the first of five slated to undergo

Flight line at the Air Force Flight Test Center, Edwards AFB, Calif., where all new U. S. Air Force aircraft have been tested since 1946.

evaluation and performance tests at Edwards under rugged field conditions comparable to those it might encounter in combat.

At the same time, AFFTC works closely with the Army Aviation Test Activity, which conducts and monitors a variety of projects, including the XV–5A fanjet V/STOL built for the Army by Ryan Aeronautical and General Electric Companies. Extensive AFFTC support in the XV–5A program includes vital chase and pace planes and pilots, documentary and engineering photography and miscellaneous services. This goes not only for the Army but the contractors as well.

An even closer working partnership developed in testing the CH–47A Chinook helicopter—the Army's biggest. It involves AFFTC and Army test pilots and cross training of both.

A striking example of close AFFTC cooperation with private industry is the XB–70 test program. Air Force and contractor pilots have shared the controls on nearly all of the 19 test flights thus far in the huge research jet built by North American Aviation, Inc. Perhaps by the time you read this, the six-engine delta wing jet will have proved its design capability of cruising at 2,000 mph (three times as fast as sound) at 70,000 feet. The first of the two 225-ton research craft built for the Air Force neared that goal last June 30 by reaching 1,870 mph (Mach 2.85) at 68,000 feet on its 14th test hop. It was first flown Sept. 21, 1964. All four pilots—two Air Force and two North American—have been checked out in the first four flights of the newer and second XB–70 at Edwards. Its maiden flight was made last July 17.

No discussion of AFFTC joint endeavor could be complete without mention of the X–15 rocket research program. Former Air Force Secretary Eugene M. Zuckert called it "unquestionably one of the most successful partnerships ever" during an Edwards visit two years ago. He stressed the close Air Force-National Aeronautics and Space Administration (NASA) cooperation in which "design altitude and speed have been surpassed by wide margins."

More than 140 research flights have been made in the world's fastest and highest flying winged aircraft since the start of the joint space-probing program more than six years ago. Three of the North American Aviation-built Air Force X–15's have since been used as flying laboratories. Much knowledge and data have been gained in studies of aerodynamic, structural and physiological problems of re-entry.

Lieutenant Colonel Robert M. White flew the X–15 to an official world record height of 314,750 feet (59.6 miles) on July 17, 1962, making him the Air Force's first winged astronaut. Major Robert A. Rushworth and Captain Joe H. Engle have joined him in that distinctive military rating with research flights more than 50 miles high. NASA's Joseph A. Walker set separate unofficial speed and altitude records of 4,104 mph and 354,200 feet (67 miles) on June 27, 1962, and Aug. 22, 1963, respectively. Extra fuel tanks and other modifications of one of the X–15's is expected to enable it to fly at 5,400 m.p.h., eight times the speed of sound.

Nearly every kind of airplane used by the Air Force sice 1946 has been flight tested at Edwards. Improved versions of models already in use (operational) as well as entirely new and experimental (research) ones are put through their aerial paces to determine whether they meet exacting Air Force needs. The complexities of flight testing become apparent with an understanding of the Air Force functional approach to its weapons systems—manned and unmanned. Aircraft are generally regarded as one of two kinds of systems, depending on function. Combat planes (fighters, bombers, interceptors) are weapons systems. Non-combat (trainers, transports, reconnaissance, weather) types are support systems. Various sections of the aircraft (tail assembly, landing gear, engine, fuselage, heating), called subsystems, are complex systems themselves. They first undergo rigorous individual ground and air testing before installation in the aircraft for which they are designed. Later the process is repeated when the prototype aircraft is ready for testing as a complete system.

Tests to determine the independent and collective performance, stability and reliability of systems, subsystems and components are designed to cover many vital operational requirements. Among them are compatibility of components; capabilities and limitations under varied actual or simulated climatic conditions; durability and acceptability of maintenance qualities; parts use rate; support facility needs; personnel and training demands.

Meanwhile, reams of data—electronically and otherwise gathered—are sifted and studied for the all important continual evaluation necessary through every stage of research and development.

Obviously very little of this is a one-man job. Teamwork is the key that unlocks the door to progressive research, particularly at the Air Force Flight Test Center.

Our efforts were most aptly summed up by General John P. McConnell, Air Force Chief of Staff, in marking the Air Force's 18th Anniversary as an independent service.

"Keeping pace with the dramatic advances in technology, the Air Force has served as the nation's foremost deterrent to aggression and as a versatile tool in helping to protect our national interests wherever they were threatened.

"This outstanding record was achieved not because of the advanced weapons systems in our inventory but mainly because of the dedication and professionalism of our people."

The X–15 manned research rocket plane being prepared for an extreme altitude mission at the Air Force Flight Test Center

Parachutes blossom high over Southern California's El Centro Naval Air Facility as a USAF C–141 transport aircraft drops a record 70,195 pounds.

FROM THE SPEAKERS ROSTRUM

Hon. Cyrus R. Vance

Address by Honorable Cyrus R. Vance, Deputy Secretary of Defense at the Annual Dinner of the National Security Industrial Association, Washington, D. C., Oct. 7, 1965.

I deeply appreciate this opportunity to speak before a group so concerned as you are with the security of our country, and so directly involved with the preservation of its strength and freedom.

Exactly five weeks ago tonight—in a distant country—a political document appeared.

It was written by the Defense Minister of the most populous nation on earth.

It was written by Lin Piao, the Vice Chairman of the Central Committee of the Chinese Communist Party—Vice Premier of Red China and the Minister of National Defense.

Ostensibly, it is an article commemorating the 20th anniversary of the defeat of Japan in World War II. But that was merely a convenient occasion for its publication. For it is no ordinary commemorative article.

I want to talk to you about that document tonight. For it tells us not only what Peking's intentions are in Asia—not only what Peking's intentions are in Vietnam—not only what Peking's intentions are toward the United States—but what Peking's plans are for the whole expansion of world communism.

The document begins with a lengthy analysis of the communist revolution in China. Lin Piao states bluntly:

"It was on the basis of the lessons derived from the people's wars in China that Comrade Mao Tse-tung, using the simplest and most vivid language, advanced the famous thesis that 'political power grows out of the barrel of a gun.' He clearly points out: The seizure of power by armed force, the settlement of the issue by war is the central task and highest form of revolution. This Marxist-Leninist principle of revolution holds good universally, for China and for all other countries."

Lin Piao then goes on to note that the Chinese communist revolution differed from the Russian revolution in one essential respect. The Russian revolution, he says, "began with armed uprisings in the cities, and then spread to the countryside; while the Chinese revolution won nationwide victory through the encirclement of the cities from the rural areas, and the final capture of the cities."

Now, he comes to his central point. The "rural areas of the world" today, he asserts, are Asia, Africa and Latin America. The "cities of the world" are North America and Europe.

Just as communism in China, says Lin Piao, succeeded by capturing the countryside and then encircling and defeating the cities, so the global communist movement will ultimately succeed first by capturing Asia, Africa and Latin America—thereby encircling North America and Western Europe—and then by finally and decisively defeating the United States and its western allies.

Win Asia, Africa and Latin America through "wars of national liberation," says Lin Piao, and the United States and its western allies will be surrounded, will be encircled, will be overwhelmed."

And *where* is all this to begin? he asks.

It has already begun, he replies. And the place in which it has begun is Vietnam.

Vietnam, says Lin Piao, is now the "focus" of the revolutionary movement against the United States. No matter what action America may take in Vietnam, he adds, the Communist Chinese determination is "unshakable" to drive the United States out.

But it is not Peking that is fighting in Vietnam; it is Hanoi. Mao is not risking his own troops to achieve his ends. Rather, Hanoi is being used to attempt to prove the validity of his thesis.

For the whole point of Mao's doctrine is that Hanoi and the Viet Cong should fight on; that they should reject any offers of reasonable settlement or negotiation; that they should be prepared to wage a prolonged and dirty war—whatever its cost in North Vietnamese blood, whatever its cost in North Vietnamese well-being.

Hanoi might well ponder whether its future is best secured by fully submerging its own separate interest to Peking. The North Vietnamese people deserve a better future than that.

Meanwhile, the leaders in Hanoi—much to Peking's pleasure—continue to make a reasonable settlement impossible. They continue their aggression in the south. They continue to infiltrate soldiers, equipment and supplies across the border. They continue to employ the twin pressures of temptation and terrorism—tempting the peasants to renounce their loyalty to their village leaders in return for hollow promises, and terrorizing them if they refuse.

There could be no clearer justification of why we are standing firm in our resolve to help defend the 14 million people of South Vietnam against communist aggression and subversion from the north.

What *is* the United States policy there?

Our policy is simple and straightforward. It is not complicated by any doctrinate theories of world domination.

First, we are determined to keep our commitment to the people of South Vietnam. We are going to continue to assist the South Vietnamese to resist aggression. We are going to continue to make it clear to Hanoi and to Peking that terrorism, murder, subversion and infiltration from the north cannot—and will not—succeed.

As President Johnson has pointed out:

"We are . . . there to strengthen world order. Around the globe from Berlin to Thailand are people whose well being rests in part on the belief that they can count on us if they are attacked. To leave Vietnam to its fate would shake the confidence of all these people in the value of an American commitment and in the value of America's word. The result would be increased unrest and instability, and even wider war."

Second, we are committed to help create a better life for the people of South Vietnam. We are engaged in a major program of economic and social development there, and we want to see it extended to the whole South Asia region, including North Vietnam.

Everything that we do in Vietnam

is governed by those simple reasons for being there.

Our goal is a peaceful settlement. We are ready—now—to go to the negotiating table. We lay down no preconditions for such discussions. We seek a cessation of aggression by North Vietnam. We seek a just peace —and we have made that offer clear on many occasions. We seek the withdrawal of *all* foreign forces—includnig our own—from South Vietnam once peace has been restored. And we seek a peace that guarantees freedom of choice for the South Vietnamese people.

Our purpose is firm; our patience is long; and our perseverance is unshakable.

But, as both Hanoi and Peking have pointed out, the issue is larger than merely Vietnam.

General Giap, the North Vietnamese strategist who defeated the French at Dien Bien Phu, has put the matter candidly: "South Vietnam is the model of the national liberation movement of our time. . . . If the special warfare that the U. S. imperialists are testing in South Vietnam is overcome, then it can be defeated anywhere in the world."

And—as we have seen—Lin Piao describes the struggle in Vietnam as merely the curtain-raiser in the whole global drama of communist expansionism.

The issue, then, in Vietnam, important as it is, is not the only task facing the United States and its partners in freedom around the world.

It is an essential task. But is not the total task.

The total task of free men on this planet is to preserve and nurture freedom *everywhere* that it is growing.

Lin Piao sees a major crisis in human society in the second half of the 20th Century; he sees it taking place on the perimeter of the industrialized world—in Asia, in Africa and in Latin America.

I think we can agree with him on that.

Let us examine why.

We can begin by reminding ourselves that the communist mind is a curious combination of ideological rigidity—and tactical suppleness.

The communist mind is, at one and the same time, philosophically closed —and pragmatically open.

In the past half century we have witnessed an imaginative display of aggressive communist tactics.

The goal has always been the same: political domination. But the path to that goal has often switched direction.

In our own lifetime, communist tactics have ranged through a broad and brutal spectrum: everything from outright occupation by the Red Army in Eastern Europe—through conventional aggression in Korea—to the guerrilla operations in Greece, Malaya, the Philippines and now in Vietnam.

Communist tactics have sometimes formented revolutions and at other times have captured those initiated by others.

Communist tactics have learned to be as much at home with legal means as with illegal means; with sophisticated societies as with primitive ones; with rightist dictators as with leftist demagogues.

Thus, if one surveys the total communist movement of the past half-century, one cannot fail to be struck with a profound bit of irony: that the communists in their ultimate view of history are almost insufferably dogmatic and doctrinaire. But in their efforts to manipulate that history, they are almost incredibly pragmatic and practical.

What, then, is *our* answer to the communist manifesto of Mao Tse-tung, as written by Lin Piao?

First, our answer is that we agree that the "focus" of the challenge lies at the moment in Vietnam.

But the government of Vietnam and the United States will not be defeated by communist aggression from the north. We will continue our support of the people of South Vietnam until a just and reasonable settlement is reached—whether by agreement at a conference table or by a cessation of the aggression, as in Malaysia, the Philippines and Greece.

Secondly, we agree with Mao that the lands arching across the southern half of the globe—Asia, Africa and Latin America—are to play a decisive role in the future of humanity.

But we disagree that their role is to be the hapless victims of communist externally directed, so-called "wars of national liberation." On the contrary, we believe that these nations desire to remain fully and freely themselves—uncoerced by subversion stage-managed and supplied from without. We believe that these nations desire, with wisdom and dignity, to seek their own national progress in their own national way. And we stand ready to assist them to do precisely that.

Thirdly, we agree that Mao's clear intent is that his brand of communism should eventually surround, encircle and finally cut off and defeat Western Europe and the United States.

But we disagree that that is going to happen. Our defenses are strong, and we remain alert and ready for whatever the future may bring. But more important is the fact that the free nations of the world offer a better future for the individual and a peaceful path to that future.

Finally, we agree with Mao that just as there are cities and countryside *within* nations, so the world at large—in its current uneven rate of technological advance—can be viewed as a series of industrialized centers, surrounded by a less-developed countryside.

But we disagree that the historical process suggests that the global countryside will storm these centers and put them to the torch of communist insurgency.

On the contrary, we believe that the historical process will be precisely the reverse; that the industrialized centers—the fortunate nations of the world—will increasingly seek to bring to the countryside—to the poorer nations of the world—the very assistance and skill that will help these nations to close the poverty gap. And the rich nations will do this by measures that will share talents and resources — by measures that will increase the self-confidence and self-reliance of the poorer nations to achieve their *own* self-sustaining political and economic growth.

In the United States we issue no global manifestos.

But we do indulge in one dream. We do entertain one grand vision. We do look to one great goal.

We are dedicated to continuing the dialogue with the rest of the world that began in an obscure hall in Philadelphia on July 4, 1776.

The men in that hall were revolutionaries.

The men in that hall did not believe that *true* political power can grow out of the barrel of a gun. They believed that true political power *can grow only out of the people themselves*—for that is precisely where it is: Within each individual human being.

Those men did not rant about class struggle. They said bluntly *that all men are created equal.*

Those men did not theorize about a dictatorship of the proletariat. They proposed something far more explosive than that. They declared *that all men had an inalienable right to life, liberty and the pursuit of happiness.*

Those men in 1776 fused, primed and set off a political explosion that has had more ultimate effect on society than all the dictators of history rolled into one.

The fires of that revolution still burn in this country; and the sparks of that revoution still fly, igniting the tinder of human aspiration all over this globe.

One of the greatest challenges to this generation of Americans is to refine the formulas

—for creating the driving sparks,

—for cultivating the leadership talent,

—for unleashing and organizing the earth's bountiful natural resources,

—for breaking down the out-of-date barriers to progress throughout the world. We have an enormous challenge to perfect the formulas to do all of these things to permit what Lin Piao calls "the countryside" to find their way up the rocky path.

We must meet that challenge.

We must offer the more durable stuff of true, creative revolution.

Lin Piao's statement of Communist China's goals for the world is 18,000 words long.

President Johnson has summed up our goals for the world in three simple sentences:

"Our own freedom and growth have never been the final goal of the American dream. We were never meant to be an oasis of liberty and abundance in a world-wide desert of disappointed dreams. Our nation was created to help strike away the chains of ignorance and misery and tyranny wherever they keep man less than God means him to be."

It is for you and me—and all of us on this small, whirling planet—to ensure that this forecast will prevail.

Mr. A. Tyler Port

Excerpts from address by A. Tyler Port, Dep. Asst. Secretary of the Army (Installations & Logistics), at Association of the U. S. Army Annual Meeting, Washington, D. C., Oct. 27, 1965.

* * * *

The Army/industry relationship must be a dynamic one, changing as newly developed strategic concepts dictate it must change: possessing the ability to produce the prosaic military hardware needed in the early 1950's; gearing up to fabricate the sophisticated designs of the post-Sputnik days; or accelerating today to produce the emergency requirements of a Southeast Asia contingency. . . .

A natural consequence of this growth has been the ability of many defense industries to operate without the infusion of large amounts of Government capital and to reach out and seek to better their positions competitively. Competition is the very essence of our free enterprise system and the life blood upon which American industry has always operated.

It has been in this area—the enhancement of competition among responsible defense contractors—that both you in industry and we in the Army still have a way to go before we can claim to have achieved an altogether ideal Army/industry relationship. I think there can be little question but that many hundreds of millions of dollars can yet be saved every year through more intelligent use of competitive procurement. And I think we must move in this direction if we are to realize our fundamental objective of building a better Army.

How can this be done? I would like to suggest that there is one major area in which we have failed to reach a mutually satisfactory solution despite all the effort already devoted toward studies, conferences, symposia and the like that have been designed to cope with the problem. I refer to the matter of transmitting useable advance planning information on Army procurement to interested and potentially interested users.

The national interest is not served when Government castigates industry for failing to see the broad view of national interest if little or no effort is made to communicate that broad view. A climate of mutual trust, understanding and common purpose must develop if we are to achieve the military strength this nation requires. To be fully meaningful, the creation of such an atmosphere must be predicated upon a longer range planning base than is normally communicated to industry through the pro forma release of standard Invitations For Bid or Requests For Proposal. Moreover, if real competition is to prevail in order to effect improvements which we need within the available dollar resources, industry must be provided with the tools by which decision affecting future courses of action can be made with greater confidence. The environment in which competition grows best is one in which industry has a more reliable basis for planning ahead.

I realize that even though we undertake this task we may never obtain the ideal competition of the market place eloquently described by many economists where supply and demand dictate not only the price but also the number of suppliers in any given field. However, it is our objective in the Military to strive toward this goal and to broaden the competitive base of defense industry to the maximum extent possible. To this end a critical review has been undertaken to determine what self-improvement measures are indicated, how these measures can be implemented and how this might, in turn, improve our Defense/industry relationship.

As a result of this review it became evident that the Army was perhaps using too narrow a definition of competition—limiting it oftentimes to the act of bidding itself and neglecting to concentrate real efforts on the development of multiple sources. As I have already indicated, it became apparent that true competition must begin with the accumulation of information on future plans and then must be fostered by the distribution of that information to interested contractors of the defense industry. Thus, if the Army is to expect spirited competition between several responsible contractors in the 1967-1974 time frame, it must begin disseminating the best procurement planning information available in 1966.

This concept, if carried out, really changes the audience to which the Army must speak. It is no longer sufficient to rely on trade journals, Department of Commerce publications and the disseminating of information at the contracting officer level. Procurement planning information must be made available to personnel at the corporate management level charged with evaluating that information, along with other market projections and indices, normally used in reaching major management decisions. The Army must attempt to reach this top management structure of American industry and develop within it a real desire to enter the competition for more items than would normally be the case.

As realists in the every day world of commerce, we recognize that our ability to influence corporate management is directly proportional to the character and veracity of the procurement information disseminated by us. Broad general statements of intent are clearly insufficient as a basis for industry decisions involving the commitment of corporate funds, the expansion of manufacturing facilities and the employment of a larger work force. Risks such as these by industry can only be justified on highly detailed, specific small items of hard intelligence which represent the Army procurement program in the foreseeable future. In other words, a new meaning must be given to the phrase "Defense/industry team" and the Military must adopt more businesslike information procedures in the procurement area which insures that the industrial side of this team has available, to the maximum extent practicable, the same information the Defense member is using for its own planning purposes.

Competitive procurement then is a way of the future requiring a more dedicated effort by all of us to insure such procurement is capable of providing our objective—the acquisition of quality products at the lowest attainable sound price.

If we were to furnish the defense industrialist advance planning procurement information which would permit you to compete on a broad scale, then the Army would, in turn, require the development of a mechanism whereby such information could be quickly, easily and economically transmitted to industry and, at the same time, protect the national security and avoid providing any competitive advantage to any one potential contractor or group of contractors.

Having outlined the dilemma, what have we done to overcome it?

First, during the past two years Advance Planning Briefings for Industry have been aimed at the long range planners of both procurement and research and development. As you know, we teamed with other Military Departments and DOD to have five briefings this year and will have five additional next year.

Also, we have had classified Advance Planning Briefings covering missiles, firepower, electronic warfare, communications, weapons and materiels with others such as data processing, combat surveillance and air defense scheduled to follow.

However, it is in the area of documentation containing advance planning information that the R&D effort has been attacked with more regularity than has the logistics. In fact, this R&D industry information activity led to the belief that similar programs might be possible for logistics. Let me elaborate.

Based on top level guidance, the Army develops a family of interrelated strategic plans and forecasts: the Basic Army Strategic Estimate, the Army Strategic Plan, the Army Force Development Plan, the Army Long-Range Technological Forecast, the Army Research Plan—which result in the delineation of the critical Qualitative Materiel Development objectives toward which the Army must advance if it is to develop the materiel needed to accomplis its global mission.

The Qualitative Materiel Requirements which form the hard core of the information provided under the Qualitative Development Requirements Information (QDRI) program are specific breakouts from the broad objectives established by all these planning documents. The QDRI program, in turn, is a compilation of Army R&D needs in areas in which the Army has been unable to achieve significant breakthroughs and which, if capable of being properly solved by industry, would be welcomed and funded by the Army with enthusiasm.

This new program, therefore, invites of industry unsolicited proposals about our Army of the future, as you see it. QDRI pamphlets are prepared by the Army in an unclassified format whenever possible to permit wide distribution and use by registered industries and represent one more attempt to keep you, the Army contractor, as up-to-date as possible on internal Army developments and trends.

Now, what have we been thinking of doing on the logistics side of the house to enhance the flow of information so necessary for the orderly development of the competitive base we seek?

In June of last year it became apparent that a new approach to this age old problem—the advanced dissemination of procurement information—was required if we were to provide industry something more than the broad generalization of prior years. This information was obviously available within the Army—specifically in the detailed Army Materiel Plans (AMP), however, it was not available in a format which would permit the rapid and extensive distribution we sought.

The AMP is the medium through which the Army can project its midrange program. It integrates those elements of logistics which directly affect Army materiel, research and development, procurement, deliveries, supply and distribution, production, facilities and engineering repair, overhaul and maintenance, losses and disposals, as well as sales under the Military Assistance Program.

An AMP is developed for every major item having a planned procurement value of $500,000 or more in any one of the eight fiscal years covered by the plan.

Of all the specific information contained in the AMP, we are most interested in those items dealing with the scheduled production of the item, administrative and production lead time, identity of producers and method of procurement.

It might be helpful, perhaps, if you think of the AMP as a matrix.

Into it is fed logistic guidance from the DOD which shapes the magnitude of the requirements by establishing computational parameters and by defining authorized force levels. Based upon this guidance, the number of major force units to be equipped is expressed in the Army Force Developmnt Plan and Army procurements are computed on this authorized force.

This is the type of information we knew would be useful to industry. In a very practical sense it represented the marketing information needed by corporate management in making basic decisions involving capital expenditures. The problem simply stated becomes a question of how this information could be extracted and made available to industry without compromising a host of broader considerations.

In June of last year the initial suggestion for such a plan was put to General Besson, the Commanding General of the U. S. Army Materiel Command. General Besson established the facts that such information was readily available and concurred in the desirability of releasing such information to industry. However, he recommended that a pilot test be executed to evaluate the feasibility of providing such information to industry on a continuing basis. A concept was developed whereby pertinent procurement information of interest to industry could be extracted from Army source documents in a format which would permit distribution to industry.

A program was initiated to place this vital information on an Advance Planning Procurement Information (APPI) form which was to be prepared on each end item to be procured by the expenditure of PEMA (Procurement Equipment and Missiles, Army) funds in the annual budget. This APPI data included pertinent historical and descriptive facts about the end item—the current fiscal year procurement action — and the Army's planned procurements through the following six years. This form also included statistics pertaining to quantities, monthly production rates and anticipated methods of procurement to be employed. As I am sure you can appreciate, what the Army intended to furnish on this APPI form was the best and most detailed planning information available. By the same token, however, such information was not to be something which could be construed as a commitment by the Government to buy the item described. This new test was a real effort on our part to insure we did everything possible to place you in a better competitive position and, of course, glean for ourselves the benefits of increased competition.

Faced with the problem of rapid distribution of the data collected under the new concept, the Commanding General, Army Materiel Command, established Army/Industry Materiel Information Liaison Officers in each commodity command and in the San Francisco and Los Angeles Procurement Districts. He designated the Deputy Commanding General, U. S. Army Materiel Command for Western Operations, as Project Commander. From March 2 through July 15 of this year these offices handled APPI's on a total of 176 items selected for treatment by the commodity commands. A total of 9,395 copies of these APPI's were transferred to industry either through bidder's lists or in response to requests for them from industry. Thus, interested industries were enabled under this test program to initiate action at any one of nine separate geographic locations which would permit them to receive advanced planning procurement information.

Our pilot test has been completed and our analysis reveals that the Army/Industry Materiel Information Program (AIMIP) filled a definite need and promised to return valuable benefits to both parties. Both the commodity commands and industry urged the continuance of AIMIP with increased scope. There is no question in my mind but that the program as conceived and tested provided better information for industry's use in reaching bid/no-bid decisions. I do not pretend that this program is a panacea which will solve all difficulties which face the Army/industry team in attempting to develop an expanding competitive base from which to operate. However, it is a start; it is a new approach for those of us concerned with logistics and we are already working on ways to improve its usefulness. . . .

In conclusion, let me emphasize that, with these two new Army/industry information programs. we in the Army are attempting to close the information gap between the Army and all industry—whether the action takes place in the research and development area or in the procurement-production phase of the life cycle

In pursuing both programs the Army is acknowledging once again that the money it spends is public money and the public has a right to know what that money buys within the constraints only of national security.

The Army is also reaffirming, dramatically, its support of the competitive philosophy that underlies America's uniquely successful system of private enterprise.

The Army is doing so for selfish reasons — good business reasons, if you will. The Army is convinced that only through the broadest kind of competition can it attract the very best in brains and products at the lowest sound price. In return for that benefit, the Army hopes to be able to establish a permanent program that will offer you the information you must have to compete better and to produce more.

Competition then can be all encompassing, providing the broad base of suppliers we seek while ensuring the production of acceptable products at a price which is manifestly fair to both the buyer and the seller. It is our fervent hope that the new program we hope to institute during the coming year will go a long way toward the attainment of this type of competition, permitting us to build a better Army while concurrently strengthening our defense industrial base.

It is in the realization of this goal that we in the Army are soliciting your active participation and support.

Phase Out Continues at Mobile AMA

(Continued from page 9)

Quail, AGM–28 Hound Dog, hydraulic systems, General Electric, Allison and Pratt & Whitney turbofan–30 engines and selected electronic systems.

To Warner Robins AMA, Robins AFB, Ga.:

- Management and supply of approximately 8,000 materiel management coded items peculiar to: Air-to-air missiles (AIM/AGM), C–46, C–47, C–54, C–118, C–119, C–123, C–124, C–133, C–141, B–66, HU–16, B–57, utility series and helicopter aircraft, armament and guns, corrosion control function, B–20 program, maintenance evaluation program and procurement support for Eastern GEEIA headquarters region.
- Maintenance of heating equipment (FSC 4520) and compressors and pumps (FSC 4310/20).

To Wright-Patterson AFB, Ohio:

- Management of central point cataloging and standardization program and Air Force packaging and evalution program.

Committee of College Deans to Assist in Managing DOD Logistics Training Program

The Department of Defense has established a four-man committee consisting of business school deans at the University of Alabama, the University of Minnesota, Dartmouth College and the University of Miami, Fla., to assist in managing the Defense Logistics Management Training Program.

The committee will advise Paul R. Ignatius, Assistant Secretary of Defense (Installations and Logistics), on training policies and problem areas and on the extent to which Defense and Service logistics schools meet training needs.

Members of the committee are S. Paul Garner, Dean of the School of Commerce and Business Administration, University of Alabama; Paul V. Grambsch, Dean of the School of Business Administration, University of Minnesota; Karl A. Hill, Dean of the Amos Tuck School of Business Administration, Dartmouth College; and Clark E. Myers, Dean of the School of Business Administration, University of Miami.

Dr. Nathan Brodsky of Mr. Ignatius' office will serve as chairman of the advisory committee.

An intensive joint program was launched by the Department of Defense in 1963 to provide common training in logistics management for the Army, Navy, Air Force and Defense Supply Agency.

Studies of higher education for civilian business showed many problem areas similar to those encountered in training for Defense logistics management.

The selection of deans with responsibilities for managing business schools will provide the Department of Defense with professional assistance to improve further the quality of logistics management training.

Rawco Instruments, Inc., Small Business Success in Space Program

Scientific cooperation between a small Texas electronics business firm and a large aerospace corporation may have resulted in discovery of a method of detecting and measuring the electrostatic environment in rockets and missiles ascending through and beyond the earth's atmosphere.

Electrostatic discharges have been blamed for malfunctions which have occurred during the launch phase of various space vehicles. In support of a NASA requirement, the Astronautics Division of the LTV Aerospace Corporation called on engineers from Rawco Instruments, Inc., a 14-man small business in Fort Worth, Tex. to assist in the design and to fabricate electrostatic and transient sensors to detect static charges of low and high intensity.

Four of these sensors, two to measure static charge on the rocket's skin and two to detect electrical potentials created during separation of rocket stages, were installed on a new and more powerful Scout research rocket. The Scout was launched August 10 from NASA's Wallops Island, Va., facility. The flight was successful and the sensors sent back data, now being analyzed, via telemetry during initial phases of the launch.

LTV took the measurement problem to Rawco and asked it to build sensors which could be installed in the Scout's electrical system. These sensors weighed about a pound each and were only five inches long, but construction was a meticulous task.

It was not known what electrical range had to be measured, if indeed any existed, so the electrostatic sensors were designed to report voltages over a range of 10 to 30,000 volts. The transient sensors, which measured any electrical potentials during separation of the rocket stages, were designed to record anything from 50 to 50,000 volts. All were Field-Mill type (generating voltmeter) sensors modified for special application.

Close cooperation between LTV and Rawco resulted in speedy design and fabrication of three sets of the sensors. Two of each were installed in the second and third stages of the 72-foot Scout rocket and electrostatic readings were secured during the launch.

Navy Guide for Technical Development Plans Available

The Office of the Chief of Naval Material has announced that copies of the latest edition of the "Guide for the Preparation of Technical Development Plans (NAVMAT P–3910)" are available for purchase from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.

The new guide supersedes advanced copies of the "Handbook for the Preparation of Technical Development Plans" distributed in December 1964.

The purpose of the publication is to assist principal development activities within the Naval Material Support Establishment by providing guidelines for the preparation of technical development plans. The guide is organized into 14 sections which parallel the Technical Development Plan format required by existing Navy directives.

Navy RDT&E Management Guide Available to Industry

by
D. S. Taylor
Director of Industrial Management
U. S. Naval Propellant Plant

Are you involved in Research, Development, Test and Evaluation (RDT&E) contracts with the Navy? Would you like to get a broad overview of the DOD Programming System? Do you wade through stacks of documents on the Navy RDT&E process looking for an answer to a vital question–

If the answer to any of these questions is "yes," a new publication, "Department of the Navy RDT&E Management Guide," may help you.

Although the original purpose of the guide was to meet an internal Navy requirement, its application expands beyond. For this reason, it has been made available to industry through the Government Printing Office.

The need for such a guide was first highlighted in the recent Review of Management in the Department of the Navy. Its recommendations on RDT&E included the following statement:

> ". . . as soon as practicable the Chief of Naval Research, Chief of Naval Material, and Deputy Chief of Naval Operations (Development) will . . .prepare a Management Guide that will describe planning, budgeting, execution, and appraisal of the RDT&E process."

The official beginning of the guide was a memorandum issued by the Assistant Secretary of the Navy for Research and Development on June 4, 1963, to implement the recommendations of Review of Management.

The purpose of the guide, as stated by Dr. Robert N. Morse, Assistant Secretary of the Navy (R&D), is to:

> "(1) Facilitate orientation of military and civilian personnel newly assigned RDT&E responsibilities by providing a summary overview of Department of the Navy RDT&E management 'machinery.'
>
> "(2) Provide a handy source of general information concerning RDT&E organization and procedures and references to official sources for specific details."

The Assistant Secretary of the Navy (R&D) exercised overall supervision of the project which produced a preliminary edition of the RDT&E Guide published on July 1, 1964. Preparation of the guide was a consolidated effort of many contributors including personnel from the following offices: Deputy Chief of Naval Operations (Development), Chief of Naval Development, Deputy Chief of Naval Material (Development), Office of Naval Research, Bureau of Ships and Bureau of Naval Weapons. Several Naval Reserve officers who served their two-week active duty on the project augmented the available manpower and contributed the benefits of their Naval and professional experience.

Within Navy, reception of the preliminary edition exceeded expectations. Requests for copies were immediate and numerous. The task of "smoothing" the preliminary copy and preparing the formal edition was begun immediately by a group of Naval Reserve officers under the management of Bureau of Naval Weapons Training Unit WEPTU–664.

Volume I.

The guide is published in two volumes. Volume I provides an overview of RDT&E and describes procedures for planning, programming, budgeting, appraisal and procurement. It is an integrated account, to be read from cover to cover as a complete story. However, the comprehensive index is an excellent reference source for information on specific topics. The seven chapters of Volume I cover the following topics:

Chapter I—Organization for RDT&E.

A broad overview of organization for RDT&E is provided with emphasis on responsibilities of major officials and working relationships between them. Detailed information on the organization of activities involved in RDT&E management can be found in Appendix E.

Chapter II—Planning.

The Navy Planning System is briefly outlined and procedures and responsibilities in planning of RDT&E effort are covered in greater detail. The evolution of RDT&E plans is traced from their genesis in the interaction of scientific and technological possibilities, with long-range military capability needs, to their definitive expression through formal Project Definition Phase. Marine Corps planning for RDT&E is also covered.

Chapter III—Department of Defense Programming System.

The Department of Defense Programming System and its implementation in the Department of the Navy are covered. In addition to the mechanisms of the Five-Year-Force Structure and Financial Program (FYFS&FP) and Program Change Control System, theoretical aspects of the system are also discussed.

Chapter IV—Preparation and Justification of the Budget.

The 18-month process of the development, presentation and justification of the RDT&E budget, from the development of the Program Objectives to passage of the Appropriation Act by the Congress, is presented. The objectives and mechanisms of the budgetary process and responsibilities or organizations and officials in the process are covered.

Chapter V—Execution of the Budget.

The execution of the RDT&E program is described from the budgetary standpoint. Subjects covered include apportionment and allocation of funds, reprogramming, the operation of the Secretary of Defense Emergency Fund and audits and review.

Chapter VI—Appraisal of RDT&E Effort.

The execution of the RDT&E program is discussed from the viewpoint of the appraisal of on-going effort which provides the occasion for management action. Focus is on organization, procedures and practices at the suprabureau level. The theory of management by exception and the place of planning, reporting and appraisal in its implementation are discussed. The chapter also covers Office of the Director, Defense Research & Enginering continuing review of on-going projects and the physical evaluation of equipment and weapons systems by the operating forces.

Chapter VII—Procurement of RDT&E Effort.

The chapter deals with the process of arranging for the implementation of RDT&E effort, whether performed by in-house laboratory or under contract by a non-profit institution or private industry. RDT&E procurement policies and contracting procedures for each major category of RDT&E effort are discussed as well as the more technical aspects of contracting procedures and requirements.

Volume II.

Volume II is a collection of official information, brought together for reference. It consists of nine appendices on the following subjects:

Appendix A—Glossary.

The glossary is a collection of definitions of terms used in RDT&E management. Even though definitions were culled from official directives and manuals, few have been prescribed for general use. The source of each term is identified. A reference list of sources and other glossaries is provided.

Appendix B—The Navy Directives System.

The organization of the Navy directives system is explained along with information on available aids for identifying directives applicable to particular subjects.

Appendix C—Classification Systems.

Several classification systems employed in RDT&E management are presented. The relationship between programming and appropriation classification in the RDT&E area is explained and illustrated.

Appendix D—The Nature of RDT&E Effort.

The categories of RDT&E effort into Research, Exploratory Development, Advanced Development, Engineering Development and Operational Systems Development is explained and definitions of these categories are provided.

Appendix E—Organizations.

This appendix comprises approximately half of Volume II. It represents an attempt to provide relatively detailed information on all major organizations, except laboratories, which are involved in the management of Department of the Navy RDT&E effort. In addition to the organization of the elements of the Department of the Navy, the organization of the Office of the Director, Defense Research & Engineering, the Advanced Research Projects Agency, the Weapons Systems Evaluation Group, joint agencies and other Government agencies involved in RDT&E are covered. The chapter also includes information on major RDT&E boards and advisory groups and test organizations.

Appendix F—Laboratories.

Background information on the function of the Navy's in-house laboratories is provided along with briefs on each institution. These briefs include a statement of laboratory location and mission.

Apendix G—Policies.

Some major statements of policy applicable to management of the Department of the Navy RDT&E effort are provided. These include basic defense policies, basic RDT&E policies and policies on contracting for the guide.

Appendix H—Promoting Effectiveness and Economy.

Information on management concepts, techniques and programs currently in use by the Department of Defense and the Navy to improve the utilization of funds and effectiveness and economy of operations is provided. The appendix also provides information on obtaining advice and assistance for improving the cost effectiveness of operations.

Appendix I—Charts.

This section contains both charts collected from official Government sources and original charts developed for the guide.

The guide is designed to be a "living document"—constantly responding to changes in RDT&E management and structure and processes, and constantly improving in content and presentation. The Assistant Secretary of the Navy (R&D) continues to exercise direct and personal supervision of this complete and up-to-date information on Navy RDT&E.

The Department of the Navy RDT&E Management Guide (NAVSO P–2457) may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., 20402. Volume I and Volume II are now available at a purchase price of $.60 and $1.50 per copy, respectively.

INDUSTRY BRIEFS

Raytheon Company's field engineer Joseph J. Jelinek was cited by the Air Force's Air Defense Command for his contributions to the command's electron tube life improvement program which resulted in a cost avoidance of more than $25 million over a three-year period . . . "Small Business is Big Business and Good Business," according to **McDonnell Aircraft Corporation.** Of 4,460 suppliers, 79.4 per cent are small business firms.

Lockheed-California Company, under Army contract to determine the capability of a rigid-rotor aircraft to act as a flying weapons platform, has completed special aiming accuracy tests. Aiming accuracy was tested from hover to speeds of 150 mph and at ranges up to 10,000 feet . . . **Rocketdyne** topped by six per cent its established cost reduction goal during Fiscal Year 1965. The 1965 goal was increased by 56 per cent over the previous year.

During the recent Association of the U. S. Army Annual Meeting in Washington, D. C., **Ling-Temco-Vought** published a daily tabloid, *Salute*, to keep attendees current on meeting activities . . . The Navy commended **Vitro Laboratories**' Willie W. Murray and Travis L. Curry for their work on the Polaris program.

Sylvania **Electronic** Systems has reported a saving of $9.6 million during the first half of 1965 in support of the Defense Department's cost reduction program . . . Seven Air Force officers just back from combat in Vietnam visited **McDonnell Aircraft Corporation** for an industrial briefing on their experiences with the company-produced F–4C . . . The first major supplier to receive **General Electric Company**'s Zero Defects citation was **TRW Valve Division.**

Goodyear Aerospace Corporation is working on the development of an operational float system to eliminate the rock 'n roll from ocean-based aircraft. The concept will be tested on the Navy's P–5A seaplane . . . Fairgoers at the Los Angeles County Fair's "Science USA" were fascinated by the **General Dynamics Corporation**-produced Redeye. They had the opportunity to aim and fire a simulated missile system . . . Thomas V. Jones, Chairman and President of **Northrop Corporation**, reported a savings of more than $19 million in Northrop's support of the Defense Department's cost reduction program.

Martin Company is modifying a number of B–57 twin-jet bombers for the Air Force. The B and C models are being modified to a tactical configuration . . . The completion of over five years work was marked by **Westinghouse Electric Corporation**'s Defense and Space Center when the SPG–59 radar and weapon direction equipment was delivered to the Navy . . . **Thiokol Chemical Corporation's** Elkton Division conducted its 30,000th rocket firing. The test was of a rocket motor designed to ride atop the Apollo spacecraft in the early part of its trip to the moon.

One of the sidelights of Deputy Assistant Secretary of Defense George E. Fouch's visit to **Sperry Gyroscope Company** was the witnessing of employees signing pledge cards at the start of the company's Zero Defects program . . . **Douglas Aircraft Company, Inc.**, is equipping a number of C–135 aircraft to provide communications with the Apollo space capsule. The aircraft will also provide broad, general test range support to defense programs . . . "The Research Explosion," by Assistant Secretary of the Air Force for Research and Development Alexander H. Flax was the lead article in the last issue of **Cornell Aeronautical Laboratory**'s magazine, *Perspective.*

The **Bunker-Ramo Corporation** received an "exceptional" rating from the Air Force's Los Angeles Contract Management District for its small business subcontracting procurement program. The firm issued purchase orders totaling $7 million in one year to firms qualifying as small business. . . . The Navy's 8,000th man to qualify as a helicopter pilot was Marine Corps First Lieutenant C. W. Glaser in a **Sikorsky Aircraft** UH–24 . . . Forty students and faculty members of the Brazilian National War College toured the **Newport News Shipbuilding and Dry Dock Company.** They represented a party of 80 men who were on a two-week tour of the United States as part of their War College training . . . **Douglas Aircraft Company**'s Missile and Space Systems Division plans to build a prototype device for detection and measurement of several spacecraft cabin atmosphere contaminants. The measurement probe will be designed to detect such cabin contaminants as ammonia, carbon dioxide and other gases originating from man and spacecraft equipment.

BIBLIOGRAPHY

DOD Instruction 5200.21, "Certification for Access to Scientific and Technical Information," Sept. 1, 1965. Establishes a certification procedure whereby U. S. Government or U. S. Government-sponsored research and development activities can be registered for access to scientific and technical information under cognizance of the DOD.

DOD Instruction 7720.10, "Contractor-Originated Value Engineering Change Proposals — Reporting Requirements," Sept. 10, 1965. Provides uniform procedures and formats for reporting Value Engineering Change Proposals submitted by contractors to the Departments of the Army, Navy and Air Force and the Defense Supply Agency as part of the DOD Value Engineering Program.

DOD Directive 5141.1, "Assistant Secretary of Defense (Systems Analysis)," Sept. 17, 1965. Prescribes the responsibilities, functions and authorities of the Assistant Secretary of Defense (Systems Analysis).

DOD directives and instructions may be obtained from:

Publications Distribution Branch
Office of the Secretary of Defense
Room 3B 200, The Pentagon
Washington, D. C. 20301

Order AD 617 779N Investigation of Various Activator Refractory Substrate Combinations. General Electric Co., Schenectady, N. Y. for the Air Force, June 1965, 62 pp, $3.

Order AD 618 469N Nondestructive Reliability Screening of Electronic Parts Using RF Noise Measurements. Aeronautical Div. of Honeywell, Inc., Minneapolis, Minn., for the Air Force, June 1965, 176 pp, $5.

Order AD 617 608N An Examination of the Feasibility of Modular Design for Audiovisual Autoinstructional Equipment. Air Force Behavioral Sciences Lab, Wright-Patterson AFB, Ohio, May 1965, 36 pp, $2.

Order AD 617 609N Design Considerations Influencing the Size and Cost of Optical Components in Audio-Instructional Devices. Air Force Behavioral Sciences Lab, Wright-Patterson AFB, Ohio, May 1965, 41 pp, $2.

Order AD 619 283N Review of Marine Bio-Acoustics. American Museum of Natural History, New York City, for the Navy, Feb. 1965, 100 pp, $4.

Order AD 619 574N Reveiw of Concepts and Status of Procedures for Fracture-Safe Design of Complex Welded Structures Involving Metals of Low to Ultra-High Strength Levels. Metallurgy Div., U.S. Naval Research Laboratory, Washington, D.C., June 1965, 91 pp, $3.

AD 618 065N Cryogenics Materials Data Handbook, Supplement 2. Martin Co., Denver Div., for Air Force Materials Lab, Wright-Patterson AFB, Ohio, July 1965, 265 pp, $6.

Order AD 619 038N Study of High Temperature Thermocouples. Hoskins Mfg. Co., Detroit, for the Air Force, March 1965, 79 pp, $3.

Order AD 618 103N Research Studies in Proportional Fluid State Control Components (Part 2). Giannini Controls Corp., Malvern, Pa., for the Army, March 1965, 67 pp, $3.

Order AD 618 057N Fluid Amplification. 14. Paramets Affecting the Noise in No-Moving-Parts Fluid Devices. Army's Harry Diamond Laboratories, Washington, D.C., April 1965, 92 pp, $3.

Order AD 619 866N Fluid Amplification. 15. Experimental Fluidic Analog Computation. Army's Harry Diamond Laboratories, Washington, D.C., June 1965, 54 pp, $3.

Order AD 613 711N Instrumentation. Army's Harry Diamond Laboratories, Washington, D.C., 1965, 23 pp, $1.

Order 619 813N Soviet Infrared Sensors. Library of Congress for the Air Force, July 1965, 37 pp, $2.

Order AD 619 046N Explorations in the Automation of Sensorimotor Skill Training. Stanford Research Institute, Menlo Park, Calif., for the Navy, May 1965, 81 pp, $3.

Order AD 619 529N Adaptations of Scientists in Five Organizations: A Comparative Analysis. Stanford Research Institute, Menlo Park, Calif., for the Air Force, May 1964, 128 pp, $4.

Order AD 619 266 Radiative Properties of Gases. Volume I. General Discussions. Rocketdyne Div., of North American Aviation, Canoga Park, Calif., for the Navy, August 1965, 218 pp, $6.

Order AD 617 958 Reliable Dielectric Films for Microcircuits. Stanford Research Institute, Menlo Park, Calif., for the Army, May 1965, 65 pp, $3.

Order AD 620 938 Application of Ultra-High Pressure to a Study of Organic Semiconductors. New York University's School of Engineering and Science for the Air Force, June 1965, 78 pp, $3.

Order AD 619 279 Research in Purification and Single Crystal Growth of II-VI Compounds. Eagle-Picher Research Laboratories, Miami, Okla., for the Air Force, May 1965, 131 pp, $4.

Order AD 620 297 Research on II-VI Compound Semiconductors. Clevite Corp., Cleveland, for the Air Force, May 1965, 215 pp, $6.

Order AD 619 717 Investigation of the Electrical and Optical Properties of Junctions in Vapor-Deposited Compound Semiconductors. Sperry Rand Research Center, Sudbury, Mass., for the Air Force, June 1965, 38 pp, $2.

Order AD 619 989N Hole-Drilling Strain-Gage Method of Measuring Residual Stresses. Naval Research Laboratory, Washington, D.C., July 1965, 27 pp, $2.

Order AD 618 031N Pulse Laser Instrumentation. Air Force Weapons Laboratory, Kirtland AFB, N.M., June 1965, 67 pp, $3.

Order AD 618 744N Infrared Transmittance of Optical Materials at Low Temperatures. Navy Ordnance Test Station, China Lake, Calif., June 1965, 17 pp, $1.

Order AD 620 295N Computer Program for the Analysis of Visible Spectrometric Data: Chromaticity. Naval Ammunition Depot, Crane, Ind., August 1965, 46 pp, $2.

Order AD 619 992N Deposition of Silicon on Insulating Substrates. Westinghouse Research Labs, Pittsburgh for the Air Force, July 1965, 100 pp, $3.

Order AD 619 462N Solid State Switch Study. Westinghouse, Yorkville, N.Y., for the Air Force, June 1965, 150 pp, $4.

Order AD 618 736N Research and Development for Semiconductor Surface Control and Stabilization. Motorola, Inc., Phoenix, Ariz., for the Air Force, March 1965, 113 pp, $4.

Order AD 618 909N A Functional Study of Epitaxy by Flash Evaporation. Philco Applied Research Lab, Blue Bell, Pa., for the Air Force, April 1965, 76 pp, $3.

Order AD 617 733N Evaluation of RMSRP Tungsten Sheet. Solar Div., of International Harvester, San Diego, for the Navy, July 1965, 190 pp, $5.

Order AD 618 925N The Use of Strain Softening to Improve the Properties of Refractory Metals. Materials Research Lab., Richton Park, Ill., for the Navy, March 1965, 46 pp, $2.

(Continued on page 26)

A NATO Common Defense Market

(*Continued from page 6*)

when we speak of a common market in practical living form, we speak of the organizations that we know of as common markets today which never quite achieve, but at least strive to increase, the flow of technology, capital, labor and products across borders with the minimum of interference for the specific purpose of improving the product returned for the effort expended. The goal is relatively simple. It is the process that is complex. Attempts are being made in almost every regional area of the world to group the buying powers of an entire region in order to bring the economy of scale to the production planning for the region.

Common markets in their purest sense are designed to support the most efficient producers and not to support all of the independently subsidized producers in the separate states. It will not be surprising, therefore, to see some allied industries barely maintaining themselves on a highly subsidized basis opposed to the idea of a common defense market. I do not think these people are to be criticized for we too from time to time, as this matter develops, will have to consider carefully the necessary position of our own industries.

Also, it is my opinion, derived through extensive discussions with U. S. manufacturers, that on balance the highly competitive approach that has been taken here in the U. S., particularly as a result of Secretary McNamara's cost reduction programs, places U. S. industries in fit condition for competition throughout the world. The large buying by our allies in the U. S. of defense production has proved this point. For in spite of what one may hear from time to time, this buying has been the result—not of supersalesmen—but of an increasing number of super-buyers throughout the world. Governments have increasingly insisted on purchasing nonproductive defense materials at the lowest possible cost and, thereby, saving literally billions of dollars for their taxpayers. Therefore, in this respect we are already in a sort of a common defense market because most of the major governments of NATO have already accepted the principle of buying selectively on the basis of technology and cost effectiveness in production and use.

We will undoubtedly be moving forward in the future in the development of international relationships between ourselves and certainly those nations which have placed such extensive dependence on American industry to maintain and develop a system based on these principles:

- The development of an efficient, lowest possible cost, highest possible quality defense industry.
- Minimum barriers to the free flow of capital, technology skills and products for the defense industries within the NATO alliance.
- Development of an effective specialization with the result that the defense producers in each country apply themselves to those areas of fabrication in which they have the greatest capable efficiency.
- Exploitation of the "economy of scale"—first on a selective basis and then in broader ways.
- Development of a network of industry-to-industry relationships of technical associations.

I believe the job of the Government is to try to maintain the proper policy environment for such competition by industry; to move ahead in specific selective projects with industry in the next few years to test out the operating principles.

Joint Production and Development Activities.

Having discussed the nature of a common market we can now turn to the even more practical world of dealing with specific movements towards joint arms production and other activities which will have the effect of creating a common defense market for NATO.

The record of the U. S. is tremendous in this regard. I doubt that any other nation in history has ever done more to stimulate international production and development projects. There has been more said about our exports in the past four years than has been said about those other projects and, therefore, I think it is essential to review with everybody the base from which the U. S. initiates any movement towards a NATO common market. Let me review some of the major programs that have been prompted, coddled, stimulated and supported with hundreds of millions of dollars of technology and even large amounts of hard cash by the U. S. in recent years.

First, there are a series of production programs for which the U. S. provided over $200 million in research and development technology to bring hundreds of European companies into the production of modern weapons systems.

- There was the F–104 production program, valued at $1,500 million, into which the U. S. contributed $140 million in cash.
- There was the NATO Hawk production program, valued at $660 million, into which the U. S. contributed $134 million in cash.
- There was the NATO Sidewinder production program, valued at about $40 million, into which the U. S. contributed $9 million in cash.
- There was the NATO Bullpup production program, valued at $30 million, into which the U. S. contributed $8 million in cash.
- There was the NATO Mark 44 Torpedo production program, valued at about $20 million, into which the U. S. contributed $2 million in cash.

And, of course, the U. S. programs do not end there. In the last four years there have been numerous programs of research and development on a bilateral and multilateral basis with our allies. Over $132 million was expended by the U. S. directly with its allies during these last four years on allied research programs of the following types:

- Army—Anti-tank missiles, mines, mortars, and fuses; surface-to-air missiles, radar defense against chemical agents, personnel and cargo carriers and rocket-assisted ammunition.
- Navy—Maritime patrol aircraft, radar jammers, small submarines, surface-to-surface missiles, small aircraft, oceanography, anti-submarine warfare rocket systems and sonar equipment.
- Air Force—Air-to-air and air-to-ground missiles, supersonic turbojet engines, lightweight strike aircraft, lift-thrust engines, line scan reconnaissance and airborne electronics.
- Basic research areas of the biosciences, chemical sciences, electronics, geophysics and propulsion.
- Aircraft such as the P–1127 vertical short take-off and landing aircraft.

Through cooperative research and development projects in the most recent past, work has begun on the main battle tank for the future, a heavy equipment transporter, plasma research, inertial navigation, beryllium aircraft engines, lightweight V/STOL fighter and associated engines, lift-thrust engines and the joint testing and evaluation of a wide range of aircraft.

It is hard to estimate the amount of technology flowing to Europe in these projects over and above the amount of actual cash going into the allied development work. It is even harder to estimate the hundreds of millions of dollars of technology that have been going to our allies under the Data Exchange Program. Over 500 agreements on data exchange with most of the information going one way, from the U. S. to our allies, have been active in the last four years.

- On the ground — Field radio communications, rifle and hand grenades, mortar and artillery shells, armored vehicles, protection against chemical agents, night vision devices, anti-tank missiles, air defense missiles, reconnaissance drones, dehydration and irradiation of food, armament for helicopters, optical fire control devices, boosted rocket artillery and multifuel engines.
- On the sea—Sonar and radar, communications navigation, countermeasures, tactical missiles, mines and torpedoes, tactical data systems, ship machinery, optics, hydrodynamics, ship and aircraft construction and oceanography.
- In the air—Aircraft structure, aircraft engines, range instrumentation, electronic componentry, geophysics, airborne computers, pressure

suit design, celestial tracking, tactical missiles, aerial photography, vertical take-off and landing, ejection seats, airborne navigation, aircraft arresting devices and three-dimensional radar.

And some people say it hasn't been a two-way street.

Looking to the Future.

This brings us up to the present and the need to consider the future nature of actions which will be indicative of a "movement towards what in effect would be a NATO common market for defense production." First, the question of procurement policy—some nations have complained about the action of the U. S. to place a 50 per cent price differential requirement on the consideration of purchases abroad. This has been somewhat amusing to me because in my own personal 13 years of experience with NATO supply activities almost every European nation has applied a rule of thumb such as this at some time in the past when its own balance of payments situation required it—some of them continue to do it today and, not only apply it as a rule of thumb, but actually force their military services to pay as much as a 25 per cent tariff out of their current budget on items procured abroad.

Our first consideration in thinking of futher overseas procurement policy has been in direct relation with our own export program and a self-interest recognition, on our own part, that some of the obstacles to a two-way street must be removed where large purchases from the U. S. are being undertaken by our allies. Therefore, recently in the case of Great Britain, we indicated that we could not guarantee purchases but we would be willing in selected cases to allow British industry to compete with American industry on equal terms. This, in effect, meant on our part that not only would we remove the 50 per cent rule from those items selected, but that we would also make application to the Treasury Department to remove any tariffs on items imported for the use of our own military forces.

Taking such action on a selective basis will begin to establish the environment in which a common market type industry can seek out the best ways and means of industrial cooperation in the armaments field. Whether or not this ever ends up in the removal of all barriers to the free movement of capital, materials and industry within the NATO market will depend on many considerations. Just as in the European Economic Community the entire procedure was scheduled to take over 12-15 years and, even then did not cover the field of defense production, so most of these things must be considered in any application of a common market principle to defense.

We contemplate selective projects over the next few years in three major areas:

- First, we are already developing plans for some new NATO cooperative production proposals for the 1965-1970 time frame similar to those that I mentioned before on the F–104G, the Hawk, Sidewinder, etc. We are considering systems that meet a wide range of needs throughout Europe, such as the Redeye, the Mark 12 IFF equipment, Sparrow air defense system for the F–104, tanks, and even aircraft. It would be our objective to implement such cooperative production programs with an increasing degree of competition between the using nations and, thereby, gradually develop the concepts of free trade within these projects.

- Secondly, we are looking for expansion of cooperation in research, development and technology exchange which will take off from the massive base of U. S. and allied exchanges in technology that exist today in broad general fields and apply it to the attainment of specific armaments designs for practical application to the armed forces of NATO in the post-1970 time frame.

- By far the most interesting area has been a practical examination of component and subsystems buying which has been going on in connection with the F–4 Phantom production for the British government. We have been pressing this approach because, when we examined only 17 of our leading export items, we found that the economical effect of producing these 17 items was nothing like one would expect in dealing with only 17 plus prime manufacturers. We found that over 40,000 suppliers in all 50 states of the Union in over 1,700 cities and towns were involved in the production of these 17 systems. This had been the result of essentially common market competition between the states of the United States where barriers to such competition had been completely eliminated. It was clear that, if such barriers had existed, production would have pretty well been confined to five or six major states.

Thus, we concluded that the armaments industry was not really as narrow as some suspected. To the contrary there was room for many suppliers to participate in a single weapon system program. We also concluded, however, that this type of competition was so complex that it was not the kind of procurement planning that could be done solely by Government. It would require the development of a new breed of engineer-diplomat to work ou the thousands of details necessary—for the qualification of foreign companies and the exercise of industrial competition between these foreign and American companies.

As a test, the McDonnell Aircraft Corporation has worked out these thousands of details on almost 200 components or subsystems of the F-4 Phantom and has qualified, in cooperation with British government and industry, over 100 British companies to compete with American companies on components and subsystems for the F-4 aircraft being produced for Great Britain. Depending on how this competition comes out, there is a chance that well over $150 million of business will go to these British companies and will, thereby, save that much foreign exchange for the British government.

Coming to the conclusion, I would like to translate all of these generalities into some of my own personal predictions for the future—so that we might all understand the context in which any common defense market consideration will proceed in the next 10 years.

- First, in the next 10 years I expect that our allies may purchase a minimum of $10 to $15 billion of their requirements from the U. S. by sheer virtue of the fact that most of these items will be a minimum of 30 to 40 per cent cheaper and will be highly competitive from a technical point of view—reflecting the continuing large research and development expenditures for U. S. military products.

- Secondly, I expect in the next 10 years that some $5-$10 billion of combined U. S. and allied requirements may be handled through international production and development programs—the largest amount of common production and development that has ever occurred in the history of the world.

- In the same 10 years an additional $50-$60 billion will be spent by our allies in their own countries with their own industry because it will be cheaper to do so than to warrant transportation, etc., because it will reflect continuing protection of certain defense industries.

- That proceeding in these practical ways to resolve our problems we and our allies will place in position for the 1975-85 period a new breed of industries, engineer-diplomats, capital and labor practiced in the tasks of using the common market approach to bring the economy of scale to an increasing number of production programs.

- Finally, in the period of the next 10-20 years we will see a harmonization in allied military requirements and products to an extent not ever seen before in the field of vehicles, armor, aircraft, missiles and electronics.

I trust that I have been able to give you something to think about in your own company planning and that you will find many more ways and means than I have described to participate in the scheme of things to come.

New Analysis System of Used Aircraft Oil Saves Lives, Dollars

Navy technicians at the Pensacola Naval Air Station Overhaul and Repair Laboratory have developed a new and reliable method for detecting potential aircraft engine trouble by analysis of an aircraft's used oil.

The new system, which is now under development throughout the Services, is saving the lives of pilots, passengers and millions of dollars worth of equipment.

Some have compared the system to the blood analyses used by physicians because it gives an indication of what is happening inside without actually observing the interior of the mechanism.

The process is based on the fact that engine parts are constructed of a variety of materials and that friction wear on the moving parts of an engine produce metal particles that are carried away by lubricating oil and remain in permanent suspension as a collodial solution.

Under normal operating conditions, the metal contaminants exist only in trace amounts so small that it has been nearly impossible to determine either concentration or identification by traditional wet chemical methods.

The current availability of sophisticated optical and electronic instruments, however, has made possible the achievement of a rapid and exact determination of oil contaminants in concentrations of fractions of parts per million. Coupled with this instrumental development has been the more important one of correlating the test results obtained with wear rates of lubricated metal components. By studying the oil's content, analysts are able to identify those parts which are wearing out faster than normal.

Although most planes are equipped with emergency trouble detectors, such as oil screens and chip detector devices which automatically light a warning signal in the cockpit, only oil analysis can uncover trouble before it becomes an emergency and a threat to the safety of a plane in flight.

The tests are performed by taking periodic samples of used oil from aircraft engines and sending them to laboratory facilities equipped with spectrometers designed to indicate what types of metal are present and in what amounts.

If a higher than normal concentration of any metal is found, the command which submitted the sample is notified and trouble shooting measures are initiated on the aircraft to determine the cause. After maintenance has been completed a second sample is submitted to see if excess metal is still present. If there is, a major engine overhaul is recommended.

The system produces substantial economic advantages because parts can be replaced when needed, instead of waitihg for complete engine overhauls. Thus, fewer overhauls are necessary.

In the meantime, however, there remain certain obstacles which must be overcome. Major among them is the limited number of spectro-chemical laboratory facilities available to the Military Services. With this factor particularly in mind, all three Services are currently evaluating various instruments suitable for field use which are relatively portable and which do not require the rigid environmental control necessary for the massive instruments used at the basic laboratories.

Still further in the future is the development of a predicting instrument located in the aircraft itself. This would be an in-flight instrument coupled with a computer which would be capable of monitoring increase in rate of metal concentration and of relating this information to remaining safe flight time.

Whatever the type of field instrument which eventually emerges, it will still possess only the capacity of measuring the rate of wear of lubricated parts. A ripe field for future research will be the development of an instrument which will detect impending catastrophic failures caused by abnormalities not related to wear. These include fatigue failures which, to date, have continued to defy scientific solution.

Army Testing Foam Insulated Containers

The feasibility of using polyurethane foam and aluminum foil to help control the humidity in large metal shipping containers is being investigated by the U.S. Army Materiel Command Engineer Research and Development Laboratories, Fort Belvoir, Va.

Tests and evaluation of the foam and foil as a barrier for moisture-vapor proofing are being made on the Type 2 Conex Container, which is a 6' by 8' container made of corrugated steel and weighing approximately 1,500 pounds.

Controlled Humidity Conex Containers now being used have welded steel liners and sealed double doors to obtain a moisture-vapor proof seal. A free-breathing tube containing desiccant controls the relative humidity within the container. Extremes of temperature cause extremes of thermal expansion and contraction in steel lined containers. The use of polyurethane foam and foil as a liner should provide better control of temperature extremes with more desirable thermal conditions and less moisture load on the desiccant.

Testing of the conversion kit and converted container is being conducted at Fort Lee, Va., and is expected to be completed in the summer of 1966.

Hill AF Base Gets National Glass Bank

A national glass "bank" containing more than 2,500 pieces of optical-quality glass has been transferred to Hill Air Force Base, Utah, from Olmsted Air Force Base, Pa.

The Air Force Logistics Command (AFLC) directed movement of the collection of glass to the Utah installation and designated Ogden Air Materiel Area (AMA) as custodian of the bank. Ogden AMA will be responsible for storing the glass and controlling its issue.

Glass items in the collection are unfinished blanks in various sizes which can be manufactured into lenses or mirrors by grinding and polishing. The pieces range in size from 5.2 inches to 28.75 inches in diameter and from ⅝ inch to 6 inches in thickness. The complete collection weighs more than 30,000 pounds and occupies 4,160 cubic feet of storage space.

The glass bank began as a collection of German optical-quality glass for which the National Bureau of Standards was given the responsibility for control after World War II. NBS catalogued the glass and, to make the collection more complete, contracted with an American glass manufacturer to supply blanks that would fill the gaps in the German glass sizes and types.

In 1962 responsibility for maintaining the glass bank was transferred from the National Bureau of Standards to the Air Force Logistics Command.

Bibliography

(Continued from page 23)

Order AD 616 272N Electromagnetic Studies in Shock Produced Plasmas. General Applied Science Labs., Inc., Westbury, N.Y., for the DOD Advanced Research Projects Agency, April 1965, 180 pp, $5.

Order AD 617 702N Temperature Determination in Moderately Dense High Temperature Gases by Transient Thermocouple Probes. Columbia University for the Air Force, May 1965, 30 pp, $2.

Order AD 619 027N A Bibliography on Moving Striations. Air Force Office of Aerospace Research, June 1965, 33 pp, $2.

Government research and development reports are available to science and industry at price indicated from:

Clearinghouse for Federal and Scientific Information
Department of Commerce
Springfield, Va. 22151

Authorized DOD contractors and grantees may obtain these documents without charge from:

Defense Documentation Center
Cameron Station
Alexandria, Va. 22314

DEFENSE PROCUREMENT

Contracts of $1,000,000 and over awarded during the month of October 1965:

DEFENSE SUPPLY AGENCY

1—**B. F. Goodrich Co.**, Akron, Ohio. $1,071,500. 1500 collapsible fabric fuel drums. Defense General Supply Center, Richmond, Va.

5—**Kaiser Steel Corp.**, Oakland, Calif. $3,236,925. 4,488,133 metal fence posts. Defense Construction Supply Center, Columbus, Ohio.

—**Continental Oil Co.**, Houston, Tex., $1,053,760. 296,000 barrels of diesel marine fuel oil. Lake Charles, La. Defense Fuel Supply Center, Alexandria, Va.

7—**Southern Athletic Co.**, Knoxville, Tenn. $2,203,500. 367,250 coated nylon twill ponchos. Defense Personnel Support Center, Philadelphia.

8—**The Defense Fuel Supply Center**, Alexandria, Va., has issued the following contracts for fuel oil and gasoline for use at military installations in the eastern United States: **Gulf Oil Corp.**, Houston, Tex. $2,956,796; **Socony Mobil Oil Co.**, New York City, $2,136,710; **Humble Oil & Refining Co.**, Houston, Tex. $1,676,014; and **Hess Oil & Chemical Corp.**, Pertb Amboy, N. J. $1,550,121.

11—**United Fruit & Food Corp.**, Boston. $1,109,633. 92,124 pounds of raw dehydrated shrimp. Defense Personnel Support Center, Philadelphia.

—**Northwestern Steel & Wire Co.**, Sterling, Ill. $1,355,351. 137,768 coils of concertina barbed wire (56 feet per coil). Defense Construction Supply Center, Columbus, Ohio.

12—**Oscar Mayer & Co.**, Madison, Wis. $1,463,708. 2,656,929 pounds of canned frankfurters. Defense Personnel Support Center, Subsistence Regional Headquarters, Chicago.

18—**Allen Overall Co.**, Monroe, N. C., $1,047,151. 314,460 men's cotton poplin coats. Defense Personnel Support Center, Philadelphia.

—**Joseph Pickard's Sons Co.**, Philadelphia. $9,109,783. 38,336 bundles of steel landing mats. Defense Construction Supply Center, Columbus, Ohio.

—**Syro Steel Co.**, Girard, Ohio. $8,142,226. 34,664 bundles of landing mats. Defense Construction Supply Center, Columbus, Ohio.

19—**Eastman Kodak Co.**, Rochester, N.Y. $1,385,083. 16,000 rolls of aerial photographic film. Defense General Supply Center, Richmond, Va.

20—**Monsanto Chemical Co.**, St. Louis. $1,946,000. 350,000 gallons of herbicide. Monsanto, Ill. Defense General Supply Center, Richmond, Va.

21—**Oscar Mayer & Co.**, Madison, Wis. $1,387,923. 1,254,624 cans of pork sausage links. Defense Personnel Support Center, Philadelphia.

—**Bryan Bros. Packing Co.**, West Point, Miss. $1,453,908. 1,464,360 cans of pork sausage links. Defense Personnel Support Center, Philadelphia.

22—**Diamond Fruit Growers**, Hood River, Ore. $1,063,386. 145,000 cases of canned pears. Defense Personnel Support Center, Philadelphia.

—**Shell Oil Co.**, New York City, $2,763,000. 1,500,000 barrels of fuel oil. Defense Fuel Supply Center, Alexandria, Va.

26—**Fred Whitaker Co.**, Philadelphia. $1,593,256. 1,246,000 pounds of scoured and carbonized wool. Defense Personnel Support Center, Philadelphia.

—**North American Packing Corp.**, Boston. $1,326,652. 276,386 six-pound cans of corned beef. Defense Personnel Support Center, Philadelphia.

—**International Shoe Co.**, St. Louis, $1,043,828. 164,856 pairs of men's black leather oxford dress shoes. Defense Personnel Support Center, Philadelphia.

—**J. F. McElwain Co.**, Nashua, N.H. $1,562,500. 250,000 pairs of men's black leather oxford dress shoes. Defense Personnel Support Center, Philadelphia.

—**Genesco, Inc.**, Nashville, Tenn. $1,263,200. 200,000 pairs of men's black leather oxford dress shoes. Defense Personnel Support Center, Philadelphia.

—**Council Mfg. Corp.**, Fort Smith, Ark. $1,159,854. 215 Prefabricated panel-type refrigerators. Defense General Supply Center, Richmond, Va.

27—**United States Steel Corp.**, Cincinnati, Ohio. $1,614,045. 158,500 spools of barbed wire. Joliet, Ill. Defense Construction Supply Center, Columbus, Ohio.

—**Joseph Pickard's Sons Co.**, Philadelphia. $8,995,542. 38,336 bundles of steel landing mats. Defense Construction Supply Center, Columbus, Ohio.

—**Syro Steel Co.**, Girard, Ohio. $8,142,226. 34,664 bundles of steel landing mats. Defense Construction Supply Center, Columbus, Ohio.

28—**Golden Eagle Refining Co.**, Los Angeles. $1,016,520. 516,000 barrels of No. 6 fuel oil. Defense Fuel Supply Center, Alexandria, Va.

—**Anaconda Wire & Cable Co.**, New York City. $1,010,718. 278,000 feet of telephone cable. Defense Industrial Supply Center, Philadelpbia.

—**Thermo King Corp.**, Minneapolis. $1,598,000. 1,000 refrigeration units. Defense General Supply Center, Richmond, Va.

29—**Standard Oil Company of California**, San Francisco. $2,031,000. 1,050,000 barrels of No. 6 fuel oil. Defense Fuel Supply Center, Alexandria, Va.

—**Union Oil Company of California**, Los Angeles. $1,158,000. 600,000 barrels of No. 6 fuel oil. Defense Fuel Supply Center, Alexandria, Va.

ARMY

1—**Eugene Luhr & Co.**, and **Massman Construction Co.**, Columbus, Ill. $1,045,000. Construction work on the Ohio and Missouri Rivers Navigation Project. Engineer District, St. Louis.

4—**William McWilliams Industries**, New Orleans. $1,754,592. Work on the Atchafalaya Flood Control Project. Engineer District, New Orleans.

6—**Allis-Chalmers Mfg. Co.**, York, Pa. $8,001,845. Manufacture and delivery of five hydraulic turbines for the Ozark Lock and Dam powerhouse, Ozark, Ark. York. Engineer District, Little Rock, Ark.

—**Cutler-Hammer, Inc.**, Deer Park, N.Y. $1,608,150. One prototype and four service test models of a Search and Intercept Assembly with technical report and ancillary items. Army Electronics Command (AMC), Fort Monmouth, N.J.

7—**Ford Motor Co.**, Dearborn, Mich. $1,444,000. ¼-ton utility trucks. Highland Park, Mich. Army Mobility Command (AMC), Warren, Mich.

—**Collins Radio Co.**, Dallas, Tex. $1,200,000. Air-to-ground communication sets (AN/ARC–54). Army Electronics Command (AMC), Fort Monmouth, N.J.

8—**Hughes Aircraft Co.**, Culver City, Calif. $4,178,655. Research on use of TOW (Tube launched Optically Tracked Wire guided missile) weapon on helicopters. Tucson, Ariz. and Culver City. Los Angeles Procurement District, Pasadena, Calif.

—**Chamberlain Corp.**, Scranton, Pa. $3,558,250. 175mm projectiles. Scranton. Ammunition Procurement and Supply Agency (AMC), Joliet, Ill.

12—**National Cash Register Co.**, Dayton, Ohio. $1,141,645. Classified electronics equipment. Electronics Command (AMC), Fort Monmouth, N.J.

13—**Harvey Aluminum** Sales, Torrance, Calif. $24,802,693. Ammunition. Milan, Tenn. Ammunition Procurement and Supply Agency, (AMC) Joliet, Ill.

—**Lasker-Goldman Corp.**, New York City. $19,774,215. Construction of additional barracks and modernization of existing facilities at Washington Hall, West Point. New York Engineer District, New York City.

—**Remington Arms Co.**, Bridgeport, Conn. $28,476,117. Ordnance items. Independence, Mo. Ammunition Procurement and Supply Agency (AMC), Joliet, Ill.

—**Thiokol Chemical Corp.**, Bristol, Pa. $1,315,410. Ammunition. Marshall, Tex. Ammunition Procurement and Supply Agency (AMC), Joliet, Ill.

—**Holston Defense Corp.**, Kingsport, Tenn. $17,960,195. Production of various types of propellants and explosives. Kingsport. Ammunition Procurement and Supply Agency (AMC), Joliet, Ill.

14—**A. O. Smith Corp.**, Milwaukee, Wis. $7,202,732. Acquisition or fabrication of equipment for production of. ordnance items. Waco, Tex. Ammunition Procurement and Supply Agency (AMC), Joliet, Ill.

—**Peter Kiewit Sons' Co.**, Vancouver, Wasb. $4,950,711. Excavation and grading work on John Day Lock and Dam Project. The Dalles, Ore. Engineer District, Walla Walla, Wash.

—**Decitron Electronics Corp.**, Brooklyn, N.Y. $2,494,800. Radio sets (AN/GRC–19). Army Electronics Command (AMC), Philadelphia, Pa.

—**Raytheon Co.**, Lexington, Mass. $1,432,228. Ordnance items. Bristol, Tenn. Ammunition Procurement and Supply Agency, (AMC), Joliet, Ill.

15—**Quiller Construction Co.**, Los Angeles. $2,926,000. Construction of an enlisted mens barracks complex at Fort Irwin, Calif. Engineer District, Los Angeles.

—**Hupp Corp.**, Canton, Ohio. $4,467,811. Industrial type engines. Army Mobility Equipment Center (AMC), St. Louis.

—**Chrysler Corp.**, Highland Park, Mich. $5,251,829. Combat engineer vebicles and repair parts. Center Line, Mich.; Eynon, Pa.; and Dayton, Ohio. Army Weapons Command (AMC), Rock Island, Ill.

—**Bell Helicopter Co.**, Fort Worth, Tex. $4,946,224. Basic Instrument helicopter trainers. Army Aviation Command (AMC), St. Louis.

18—**RCA**, Moorestown, N.J. $1,805,337. Continued research and development on a component verification program for the SAM–D (Surface to Air Missile-Development). Army Missile Command, Huntsville, Ala.

—**Great Lakes Dredge and Dock Co.**, Cleveland, Ohio. $3,244,500. Work on the Conneaut Harbor Project, Conneaut, Ohio. Engineer District, Buffalo, N.Y.

19—**Ashbach Construction Co.**, St. Paul, Minn. $4,300,136. Work on the St. Paul and South St. Paul Local Flood Protection Project. Engineer District, St. Paul, Minn.

—**Hercules Powder Co.**, Wilmington, Del. $16,212,,624. Reactivation of the Sunflower Army Ammunition Plant, Lawrence, Kan. and for production of propellant powder for 2.75 inch rockets. Ammunition Procurement and Supply Agency (AMC), Joliet, Ill.

—**R. G. LeTourneau**, Longview, Tex. $1,192,046. Ammunition components. Ammunition Procurement and Supply Agency (AMC), Joliet, Ill.

20—**Maremont Corp.**, Saco, Maine. $1,482,148. M60 machine guns with bipod assemblies. Saco. Army Weapons Command (AMC), Rock Island, Ill.

21—**AVCO Corp.**, Stratford, Conn. $11,559,290. Design, development, fabrication and test of gas turbine engines. Army Tank Automotive Center (AMC), Warren, Mich.

—**Varian Associates**, Palo Alto, Calif. $1,059,345. Klystron tubes for the HAWK missile system. Army Missile Command (AMC), Huntsville, Ala.

22—**Hazen & Clark, Inc.**, Spokane, Wash. $1,564,100. Lower Monumental Lock and Dam Project, Pasco, Wash. Engineer District, Seattle, Wash.

—**Martin-Marietta**, Baltimore. $2,261,340. Parts and assembly of mine field launching skids with demolition charges. Ammunition Procurement & Supply Agency (AMC), Joliet, Ill.

—**Weatherhead Co.**, Cleveland, Ohio. $1,011,032. Ammunition components. Amunition

Procurement & Supply Agency (AMC), Joliet, Ill.

25—**Hughes Aircraft Co.**, Fullerton, Calif. $1,249,287. Research and development on SAM–D (Surface to Air Missile Development) project. Los Angeles Procurement District, Pasadena, Calif.

26—**International Mapping Corp.**, Los Angeles, $1,248,000. Work on horizontal control system used to compile topographic maps. Army Map Service, Washington, D.C.

—**Lockheed Electronics Co.**, Clark, N.J. $1,658,970. Research and development services on range instrumentation equipment. White Sands Missile Range, N.M.

—**Baifield Industries**, Carrolton, Tex. $2,072,564. Bomb dispensers. Ammunition Procurement and Supply Agency, Joliet, Ill.

—**Philco Corp.**, Willow Grove, Pa. $1,897,300. Nine central office telephone switchboard, including training centers. Army Electronics Command, Philadelphia.

—**Weatherhead Co.**, Cleveland, Ohio. $2,929,290. Ordnance items. Ammunition Procurement and Supply Agency, Joliet, Ill.

27—**Remington Arms Co.**, Bridgeport, Conn. $1,727,211. 22 caliber cartridges. Frankford Arsenal, Philadelphia.

—**Magnavox Co., Fort Wayne, Ind.** $2,971,889. Vehicular radio sets. Army Electronics Command, Philadelphia.

—**Kennedy Van Saum Corp.**, Danville, Pa. $1,734,018. 105mm projectiles. Danville. Ammunition Procurement and Supply Agency, Joliet, Ill.

—**Flare Northern Division of Atlantic Research Corp.**, West Hanover, Mass. $1,247,331. Ordnance items. Ammunition Procurement and Supply Agency, Joliet, Ill.

—**Amron Corp.**, Waukesha, Wis. $6,161,992. 20mm brass cartridge cases. Frankford Arsenal, Philadelphia.

28—**Sperry Rand Corp.**, Salt Lake City, Utah. $1,254,914. Electronic assemblies for the SERGEANT missile Army Missile Command, Huntsville, Ala.

—**Federal Laboratories, Inc.**, Saltsburg, Pa. $1,021,746. Chemicals. Saltsburg. Edgewood Arsenal, Md.

—**Galion Anco, Inc.**, Galion, Ohio. $1,052,038. Ordnance items. Frankford Arsenal, Philadelphia.

29—**Chamberlain Corp.**, Scranton, Pa. $4,540,814. 175mm projectiles. Scranton. Ammunition Procurement and Supply Agency, Joliet, Ill.

—**Rohn and Haas Co.**, Philadelphia. $2,900,000. Continuation of research and developmentl of solid and hybrid rocket propellants and propulsion. Redstone Arsenal, Ala. Army Missile Command, Huntsville, Ala.

—**Continental Motors Corp.**, Muskegon, Mich. $12,665,676. Multi-fuel engines for 5-ton trucks. Army Mobility Command, Warren, Mich.

—**FMC Corp.**, San Jose, Calif. $18,774,564. $10,525,614. Cargo, mortar, personnel and armored personnel carriers. Charleston, W. Va. Army Tank Automotive Center, Warren, Mich.

—**Finchbaugh Products, Inc.**, Red Lion, Pa. $1,380,488. 90mm target practice tracer shells. Ammunition Procurement and Supply Agency, Joliet, Ill.

—**Hupp Corp.**, Canton, Ohio. $5,863,536. Two and four cylinder, gasoline driven engines. Army Mobility Equipment Center, St. Louis.

—**Kaiser Jeep Corp.**, Toledo, Ohio. $1,317,643. ¼-ton utility trucks. Army Tank Automotive Center, Warren, Mich.

—**General Dynamics Corp.**, Pomona, Calif. $41,071,861. FY 66 procurement of REDEYE. Los Angeles Procurement District, Pasadena. Calif.

—**Ashbach Construction Co.**, St. Paul, Minn. $1,842,736. Work on Buffalo Bayou Project. Houston, Tex. Engineer District, Galveston, Tex.

—**Akers and Akers Contractors**, Dana, Ky. $1,040,148. Construction of Millard High School. Near Pikeville, Ky. Engineer District, Huntington, W. Va.

—**General Motors**, Indianapolis. $3,753,540. Transmissions for the Main Battle Tank. Army Tank Automotive Center, Warren, Mich.

—**Astrodata, Inc.**, Anaheim, Calif. $1,119,740. Advanced range testing, report and control. White Sands Missile Range, N.M.

—**Kennedy Van Saum Corp.**, Danville, Pa. $1,661,262. 105mm tracer projectiles. Danville. Ammunition Procurement and Supply Agency, Joliet, Ill.

—**Kaiser Jeep Corp.**, Toledo, Ohio. $53,323,287. 5-ton trucks. South Bend, Ind. Army Mobility Command, Warren, Mich.

NAVY

1—**Grumman Aircraft**, Bethpage, N.Y. $11,442,600. Long lead time effort to support FY 66 procurement of A6A weapons systems. Bureau of Naval Weapons.

—**Westinghouse Electric**, Baltimore. $31,620,743. Airborne radar sets. Bureau of Naval Weapons.

—**United Aircraft**, E. Hartford, Conn. $5,059,548. TF33 engines for the Air Force. Bureau of Naval Weapons.

4—**Elliott Co.**, Washington, D.C. $1,207,918. Two steam booster compressor plants for aircraft catapults, related technical data and services and installation of plants on an aircraft carrier. Jeannette, Pa. Bureau of Ships.

—**Interstate Electronics Corp.**, Anaheim, Calif. $1,859,675. POLARIS test instrumentation equipment. Special Projects Office.

—**General Electric**, Santa Barbara, Calif. $3,403,450. Development and implementation of a management system for the evaluation of material readiness of the Fleet Ballistic Missile Submarine Force. Special Projects Office.

5—**Columbia University**, New York City. $2,923,000. Continuation of research in underwater sound and related subjects to improve submarine detection. Dobbs Ferry, N.Y. Office of Naval Research.

6—**General Dynamics**, San Diego, Calif. $1,221,400. Continuation of research in ocean data processing. San Diego and Point Mugu, Calif., south of Puerto Rico and off the Straits of Florida. Office of Naval Research.

7—**Curtiss-Wright Corp.**, Wood-Ridge, N.J. $1,044,952. Spare parts for A–1, P–2 and C–121 aircraft engines. Navy Aviation Supply Office, Philadelphia.

—**Untied Aircraft**, E. Hartford, Conn. $52,992,108. TF33 engines for the Air Force. Bureau of Naval Weapons.

—**Airtemp Division, Chrysler Corp.**, Dayton, Ohio. $1,154,788. Shipboard air-conditioning equipment. Bureau of Ships.

—**General Electric**, W. Lynn, Mass. $4,191,435. Spare parts for CH–53A helicopter engines. Navy Aviation Supply Office, Philadelphia.

8—**Sierra Research Co.**, Buffalo, N.Y. $1,146,810. Shipboard operational telemetry systems and related equipment for QH–50C DASH helicopters. Buffalo. Bureau of Naval Weapons.

11—**United Aircraft**, E. Hartford, Conn. $8,300,000. Design and development of the TF30 engine for the Air Force. Bureau of Naval Weapons.

—**McDonald Aircraft**, St. Louis. $2,250,300. Hook assemblies used in carrier arresting systems for RF–4B aircraft. Navy Aviation Supply Office, Philadelphia.

—**General Electric**, Pittsfield, Mass. $2,454,337. Operational support studies for the POLARIS MK84 fire contract systems and MK412 test sets. Special Projects Office.

12—**ITT Gilfillan, Inc.**, Los Angeles. $1,336,970. Air traffic control radar sets for installation aboard aircraft carriers. Bureau of Ships.

13—**North American Aviation**, Anaheim, Calif. $1,840,000. Gyroscopes. Bureau of Ships.

—**Bendix Corp.**, Teterboro, N.J. $3,809,168. Auto-pilot system components. Navy Aviation Supply Office, Philadelphia.

14—**Grumman Aircraft Engineering Corp.**, Bethpage, N.Y. $22,000,000. FY 66 procurement of A–6B aircraft. Bureau of Naval Weapons.

15—**Johns Hopkins University, Applied Physics Laboratory**, Silver Spring, Md. $4,903,155. Continued research and development work on guided missile systems. Bureau of Naval Weapons.

—**Hughes Aircraft**, Culver City, Calif. $14,000,000.Phoenix missile systems. Bureau of Naval Weapons.

18—**Collins Radio Co.**, Cedar Rapids, Iowa. $1,102,603. AN/ARC–52 radio components. Navy Aviation Supply Office, Philadelphia.

—**Aluminum Company of America**, Lafayette, Ind. $1,374,118. Aluminum extrusions for airfield matting. Navy Air Engineering Center, Philadelphia.

19—**University of California**, Berkeley, Calif. $2,276,948. Research in marine physics. San Diego, Calif. Office of Naval Research.

—**Admiral Corp.**, Chicago. $1,610,603. Radar test sets and modification kits. Bureau of Ships.

—**Boeing Co.**, Morton, Pa. $11,460,000. CH–46A helicopters. Bureau of Naval Weapons.

20—**United Aircraft**, E. Hartford, Conn. $7,010,686. Jet engine spare parts. Navy Aviation Supply Office, Philadelphia.

—**Litton Systems, Inc.**, Van Nuys, Calif. $3,900,000. Spare parts for Digital Real-Time Computers used in E–2A aircraft. Navy Aviation Supply Office, Philadelphia.

21—**Technical Material Corp.**, Mamaroneck, N.Y. $1,304,160. Radio transmitters for use at shore based radio stations. West Nyack, N.Y. Navy Purchasing Office, Washington, D.C.

25—**United Aircraft**, Stratford, Conn. $10,400,000. Material and tooling to support FY 66 procurement of CH–53A helicopters. Bureau of Naval Weapons.

—**Johns Hopkins University, Applied Physics Lab**, Silver Spring, Md. $4,885,912. Continued Research and development on guided missile systems. Bureau of Naval Weapons.

—**Sun Shipbuilding & Dry Dock Co.**, Chester, Pa. $3,220,000. Construction of the Deep Submergence Reesarch Complex, Chamber "A" at Annapolis, Md. Director, Chesapeake Div., Bureau of Yards and Docks.

26—**Westinghouse Electric Corp.**, Baltimore. $13,451,061. Modification for airborne radar sets. Bureau of Naval Weapons.

—**Ling-Temco-Vought, Inc.**, Dallas, Tex. $1,465,000. Adapter kit pylons for F–8E Crusader aircraft. Navy Aviation Supply Office, Philadelphia.

27—**Avondale Shipyards, Inc.**, Avondale, La. $3,426,416. Activation and modernization of fleet tanker USS TAPPAHANNOCK (AO–43). Industrial Manager, Eighth Naval District.

28—**Technical Material Corp.**, Mamaroneck, N.Y. $1,817,756. Radio transmitter sets. Navy Purchasing Office, Washington, D.C.

—**Curtiss Wright Corp.**, Wood-Ridge, N.J. $1,187,233. Aircraft engine spare parts. Navy Aviation Supply Office, Philadelphia.

—**AiResearch Mfg. Co.**, Phoenix, Ariz. $1,263,160. Speed drive units for A6A and EA–6A aircraft. Navy Aviation Supply Office, Philadelphia.

—**Sun Electric Corp.**, Chicago. $2,724,736. Mobile electric power plants for use on aircraft carriers to start and service jet aircraft. Navy Purchasing Office, Washington, D.C.

—**General Motors**, Indianapolis. $1,542,011. Aircraft Engine spare parts. Navy Aviation Supply Office, Philadelphia.

—**Joseph Pickard's Sons Co.**, Philadelphia. $1,883,255. Fabrication of matting for SATS (Short Airfield Tactical Support) construction. Naval Air Engineering Center, Philadelphia.

29—**Canadian Commercial Corp.**, Montreal, Canada. $2,415,878. Transport aircraft engine spare parts. Navy Aviation Supply Office, Philadelphia.

—**General Dynamics**, Rochester, N.Y. $3,892,912. Radio receivers for use on naval ships. Bureau of Ships.

AIR FORCE

1—**Boeing Co.**, Wichita, Kan. $1,372,384. B–52 wing pylons. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

4—**Boeing Co.**, Seattle, Wash. $1,934,360. Assembly, installation and checkout of MINUTEMAN missiles. Grand Forks, AFB, N.D. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**Garrett Corp.**, Phoenix, Ariz. $1,730,746. Engine starters for F–4 aircraft. Phoenix. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

5—**Douglas Aircraft**, Santa Monica, Calif. $2,856,458. Procurement of THOR space boosters. Space Systems Div., (AFSC), Los Angeles.

—**Douglas Aircraft**, Santa Monica, Calif. $2,257,740. Production of GENIE rockets for training. Santa Monica and Newport Beach, Calif. Ogden Air Materiel Area (AFLC), Hill AFB, Utah.

—**General Motors**, Indianapolis. $5,277,481. T–56 aircraft engines. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**General Electric**, Cincinnati, Ohio. $2,125,000. Development work on engines for the C–5A aircraft. Aeronautical Systems Div. (AFSC) Wright-Patterson AFB, Ohio.

—**Republic Aviation Corp.**, Farmingdale, N.Y. $2,512,920. Engineering services for F–105 aircraft. Mobile Air Material Area (AFLC), Brookley, AFB, Ala.

6—**Electro-Optical Systems**, Pasadena, Calif. $1,530,200. Development of an ionization thruster for spacecraft. Systems Engineering Group, Research and Technology Div. (AFSC), Wright-Patterson AFB, Ohio.

—**General Motors**, Indianapolis, $1,927,738. Spare parts for T–56 aircraft engines. Oklahoma City Air Material Area (AFLC), Tinker AFB, Okla.

7—**Continental Aviation and Engineering Corp.**, Toledo, Ohio. $3,210,525. J–69 engines for target drone aircraft. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**International Telephone & Telegraph Corp.**, Paramus, N.J. $1,007,201. Computer services and programming for the SAC control system. Omaha, Neb. Electronics Systems Div. (AFSC), L. G. Hanscom Field, Mass.

—**North American Aviation**, Los Angeles. $2,268,339. Production and installation of 335-gallon wing tanks. Sacramento Air Material Area (AFLC), McClellan AFB, Calif.

—**Philco Corp.**, Philadelphia. $5,555,983. Aircraft control and warning system. Philadelphia. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

8—**Aerodex, Inc.**, Miami, Fla. $1,251,410. Overhaul of R–3350 aircraft engines. Miami. San Antonio Air Materiel Area (AFLC) Kelly AFB, Tex.

—**Curtiss Wright Corp.**, Wood-Ridge, N.J. $2,066,850. Procurement of R–1820 aircraft engines. Wood-Ridge. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

11—**Republic Aviation**, Farmingdale, N.Y. $2,611,858. Production of rocket catapults for aircraft ejection seats. Sacramento Air Materiel Area (AFLC), McClellan AFB, Calif.

—**FMC Corp.**, New York City. $1,372,500. Production of rocket engine fuel. Baltimore. Middletown Air Materiel Area (AFLC), Olmsted AFB, Pa.

—**Sunbeam Electronics**, Fort Lauderdale, Fla. $1,328,404. Production of aircraft flight instruments. Fort Lauderdale. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

12—**Douglas Aircraft**, Tulsa, Okla. $27,320,199. Modification of C–135 aircraft in support of the NASA APOLLO program. Electronic Systems Div. (AFSC), L. G. Hanscom Field, Mass.

—**Litton Systems, Inc.**, Woodland Hills, Calif. $11,553,000. Production of inertial navigation systems for F–4 aircraft. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Martin Marietta**. Denver, Colo. $8,055,600. TITAN II missiles and related equipment. Littleton, Colo. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**Fairchild Hiller Corp.**, St. Augustine, Fla. $2,427,594. Inspection and repair of C–130 aircraft. St. Petersburg, Fla. Warner-Robins Air Materiel Area (AFLC), Robins AFB, Ga.

—**Boeing Co.**, Wichita, Kan. $2,400,000. Modification of B–52 bomb bays. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

14—**Litton Systems**, Woodland Hills, Calif. $1,392,047. Procurement of spare parts for navigation system used on F–4 aircraft. Middletown Air Materiel Area (AFLC), Olmsted AFB, Pa.

—**Douglas Aircraft**, Santa Monica. Calif. $3,000,000. Production of space boosters. Santa Monica. Space Systems Div. (AFSC). Los Angeles .

15—**Sylvania Electric Products**, Waltham, Mass. $1,000,000. Comunications equipment for Minuteman Wing I at Malmstrom AFB, Mont. Buffalo, N.Y. and Waltham. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**Garrett Corp.**, Torrance, Calif. $1,772,293. Jet engine analyzers. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

18—**Lockheed Missiles & Space Co.**, Sunnyvale, Calif. $2,030,368. Hardening technology studies for missile sites. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**Aerojet-General Corp.**, Sacramento, Calif. $5,200,000. Production of TITAN II propulsion systems. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**Lockheed Aircraft Corp.**, Marietta, Ga. $10,000,000. Production of C–130 aircraft. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

19—**Federal Electric Corp.**, Paramus, N.J $1,939,058. Production of command and control communications equipment. Electronic Systems Div. (AFSC), L. G. Hanscom Field, Mass.

20—**General Motors**, Indianapolis. $6,336,000. Procurement of T–56 engines and related equipment. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Cessna Aircraft Co.**, Wichita, Kan. $1,150,000. T–37 aircraft, spare parts and ground equipment. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**General Electric**, Philadelphia. $1,719,630 and $10,000,000. Design, development, fabrication, flight test and data analysis of re-entry vehicles for the NIKE–ZEUS program ; and research and development of the Mark 12 re-entry program. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**Thiokol Chemical Corp.**, Bristol, Pa. $36,952,148. Production of Stage I Minuteman motors. Brigham City. Utah. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**Westinghouse Electric Corp.**, Baltimore. $1,418,645. Production of low frequency communication sets. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

—**Philco Corp.**, Newport Beach, Calif. $1,200,000. fuzing and arming tests and evaluation of re-entry vehicles. Ballistic Systems Div. (AFSC), Norton AFB, Okla.

21—**Philco Corp.**, Newport Beach, Calif. $30,201,773. Design, development, fabrication, flight test and data analysis of re-entry measurement vehicles. Newport Beach. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**International Harvester**, San Diego, Calif. $1,224,000. Auxiliary gas turbine power units for CH–47 aircraft. San Diego. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Aerojet-General Corp.**, Sacramento, Calif. $2,126,000. Production of Stage II test motors for Minuteman missiles. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**General Precision, Inc.**, Little Falls, N.J. $1,399,585. Spare parts for maintenance and overhaul of navigation equipment on C–141 aircraft. San Marcos, Calif. Middletown Air Materiel Area (AFLC), Olmsted AFB, Pa.

—**B. F. Goodrich, Akron**, Ohio. $1,279,023. Production of tires for fighter aircraft. Ogden Air Materiel Area (AFLC), Hill AFB, Utah.

—**Goodyear Co.**, Akron, Ohio. $2,138,174. Production of main wheels and brakes for F–4 aircraft. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

25—**Marquardt Corp.**, Van Nuys, Calif. $4,972,355. Work on a classified program. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Bendix Corp.**, Teterboro, N.J. $1,706,806. Spare electronic components for C–141 aircraft. Middletown Air Materiel Area (AFLC), Olmsted AFB, Pa.

—**Vinnell Corp.**, Los Angeles. $1,302,927. Maintenance and operation services at Point Barrow Air Force Camp, Alaska. Alaskan Air Comamnd.

26—**Aerojet-General Corp.**, Sacramento, Calif. $34.833,725. Production of Stage II Minuteman motors. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

27—**Litton Systems, Inc.**, Woodland Hills, Calif. $2,711,738. Spare components for maintenance of the inertial navigation system on F–4C aircraft. Middletown Air Materiel Air (AFLC), Olmsted AFB, Pa.

—**Radiation Inc.**, Melbourne, Fla. $1,044,120. Modification of automatic tracking telemetry antennaes used in space tracking. Palm Bay, Fla. Air Force Eastern Test Range, Patrick AFB, Fla.

—**Collins Radio Co.**, Cedar Rapids, Iowa. $1,038,444. Production of components for high frequency communication sets. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB. Ohio.

—**Sperry Rand Corp.**, Great Neck, N.Y. $1,287,820. Production of components for radar sets for C–141 and HC–130 aircraft. Aeronautical Systems Div. (AFSC) Wright-Patterson AFB. Ohio.

28—**Monmouth Electric Co.**, Neptune, N.J. $1,393,015. Communication equipment. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

—**Boeing Co.**, Seattle, Wash. $27,235,000. Modernization of MINUTEMAN. Whitman AFB, Knob Noster, Mo. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**Bendix Corp.**, Teterboro, N.J. $1,230,185. Flight instruments for F–111 aircraft. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Kollsman Instrument Corp.**, Elmhurst, N.Y. $6,565,761. Procurement of spare parts for mapping and survey systems. Warner-Robins Air Materiel Area (AFLC), Robins AFB, Ga.

—**Systems Development Corp.**, Santa Monica, Calif. $6,736,143. Design and development of electronic information and communication equipment for air defense systems. Electronic Systems Div. (AFSC), L. G. Hanscom Field, Mass.

—**Sperry Rand Corp.**, Washington, D.C. $11,617,270. Electronic data processing systems. Philadelphia. 2750th Air Base Wing, Wright-Patterson AFB, Ohio.

—**Fairchild-Hiller Corp.**, Hagerstown, Md. $1,085,730. Production of spare parts for F–105 aircraft, Sacramento Air Materiel Area (AFLC), McClellan AFB, Calif.

29—**General Motors**, Indianapolis. $4,256,000. T–56 aircraft engines. Aeronautical Systems Div. (AFSC), Wright-Patterson AF, Ohio .

—**F. C. Stiles Contracting Co.**, Grand Rapids, Mich. $2,857,418. Manufacture of two-story relocatable family housing units. 2750th Air Base Wing, Wright-Patterson AFB, Ohio.

—**American Electric**, Paramount, Calif. $6,400,845. Production of ordnance. Long Beach, Calif. Ogden Air Materiel Area (AFLC). Hill AFB, Utah.

—**Garrett Corp.**, Los Angeles. $2,108,141. Spare parts to support the control air data computer on F–4 aircraft, Ogden Air Materiel Area (AFLC), Hill AFB, Utah.

—**Martin-Marietta**, Denver. $1,200,000. Environmental control equipment for the TITAN II missile. Littleton, Colo. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**Boeing Co.**, Wichita. $2,114,000. B–52 flight test program. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

Three Army Missiles to be Maintained by Anniston Army Depot

Maintenance depot missions for three Army missile systems have been established at Anniston, Ala., Army Depot.

The missiles, all managed by project offices at the Army Missile Command, Redstone Arsenal, are the Lance, Shillelagh and TOW. They will be shipped from production plants to Anniston, where they will be stored, maintained and issued to units.

Decision to place these missions at Anniston Ordnance Depot was based on the opportunity to expand and fully utilize existing facilities and trained personnel at a minimum cost to the Army.

Lance is the Army's newest battlefield ballistic missile and the first to use pre-packaged storable liquid propellant. It will complement tube artillery and will extend the division commander's capability for nuclear and non-nuclear supporting fire. It is now undergoing developmental flight testing at White Sands Missile Range, N.M.

The Shillelagh is an accurate, direct fire guided missile which is launched from a combination gun-launcher. It has been selected as armament for the General Sheridan reconnaissance vehicle and the M60 tank. It will be effective against tanks, troops and field fortifications.

TOW is being developed for use by infantrymen against heavily armored tanks. The tube launched missile may be carried by troops or in a variety of light vehicles.

OFFICE OF THE SECRETARY OF DEFENSE
WASHINGTON, D. C. 20301

OFFICIAL BUSINESS

UNIVERSITY OF FLORIDA
3 1262 09683 2893

AID

FLARE

New Test Facility Operational at Wright Patterson AFB

A new "electronic shooting gallery" is in operation at Wright-Patterson Air Force Base, Ohio, to give researchers one of the nation's most versatile test grounds for airborne reconnaissance devices.

The test range is able to furnish detailed performance data of photographic, electro-optical, infrared and radar detection instruments.

Project director Robert E. Wallace, Jr., of the Air Force Avionics Laboratory's Reconnaissance Division, envisions future additions to the range to test various new reconnaissance sensors now in the research phase.

Major elements of the range are located along the east-west runway at Wright Field. They include five concrete photo pads 2,000 feet apart and painted with white photo-resolution stripes. The stripes are graded in length from 28 feet down to nearly six inches. Two asphalt slab targets, each 10 by 10 feet, are painted in various shades of gray.

Elsewhere on the base are L-shaped patterns of electrically heated target pads, for infrared resolution, spaced at intervals of 2½ feet to 50 feet apart. Another asphalt pad, 51 by 87 feet, contains eight heat-controlled targets for infrared thermal sensitivity tests.

Two hundred trihedral reflectors have been placed on the field to test radar detection apparatus for purposes of resolution and geometric fidelity measurements.

Called a Recon Multisensor Target Range, the installation is capable of handling simultaneous comparative tests of airborne reconnaissance devices. Most aircraft "shoot" from altitudes of 2,000 to 10,000 feet in checking the performance characteristics of their detection instruments.

One key feature is that the new range is instrumented to furnish detailed ground measurements concurrent with the airborne tests. During test flights, ground technicians will record meteorological data at the site such as haze, relative humidity and temperature, etc., as well as other readings pertinent to the target itself. This information is then used in interpreting the performance of the airborne apparatus.

Researchers at the Avionics Laboratory, a unit of the Air Force Systems Command's Research and Technology Division, say the range also is available to Army, Navy and other Air Force units for both operational and research support.

U.S.-U.K. Agreement Signed for Joint Lift Engine Development

The Minister of Aviation of the United Kingdom and the Secretary of Defense have signed a memorandum of understanding approving a joint project for development of an advanced lift jet engine. The work will be performed by Rolls Royce, Ltd., and an American contractor yet to be chosen.

Engines of this kind are used for V/STOL aircraft. The development could have wide application to transport as well as tactical aircraft should it result in a significant advance in lightweight engine technology.

By collaborating in this project, the U.S. and U.K. hope to achieve substantial savings in development costs in addition to getting an engine incorporating the best of each contractor's technology. As a further gain, it is hoped that the experience accumulated by the two governments in negotiating this agreement and supervising the project, can simplify the problems of and encourage further collaboration in defense research and development.

The U.S. contractor for the joint project, which is scheduled to begin early next year, will be selected on a competitive basis.